zenith

SERVICE MANUAL

Product Type: MICRO COMPONENT
Chassis: 6720AA0008A
Manual Series: LX-140
Manual Part #: 3829RAT110F
Model Line: E
Product Year: 2004

Model Series:

LX-140

CONTENTS

Published FEBRUARY 2004
LG Electronics Alabama, Inc.
201 James Record Road
Huntsville, Alabama 35824-1513

Printed in korea

[CONTENTS]

❍ SECTION 1. GENERAL

❍ SECTION 2. ELECTRICAL

❍ SECTION 3. EXPLODED VIEWS

❍ SECTION 4. SPEAKER

❍ SECTION 5. REPLACEMENT PARTS LIST

SECTION 1. GENERAL

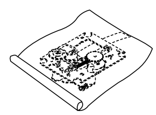
❑ SERVICING PRECAUTIONS

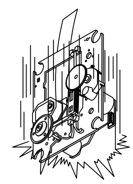
NOTES REGARDING HANDLING OF THE PICK-UP

1. Notes for transport and storage

1) The pick-up should always be left in its conductive bag until immediately prior to use.
2) The pick-up should never be subjected to external pressure or impact.

Storage in conductive bag

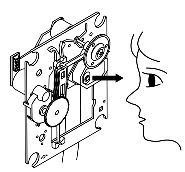




Drop impact

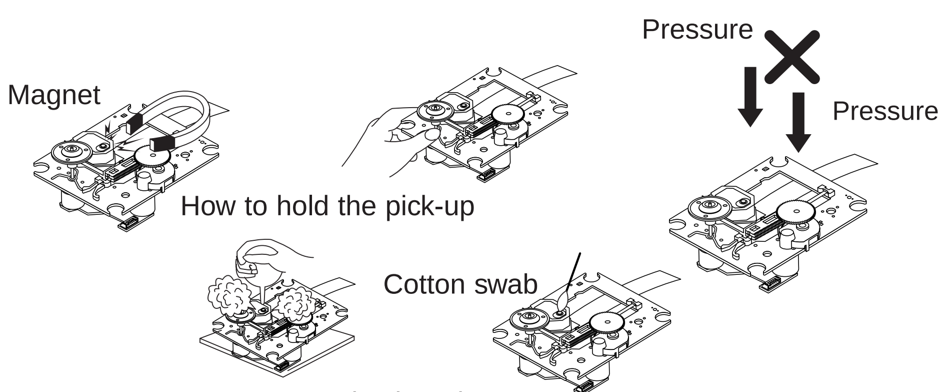
2. Repair notes

1) The pick-up incorporates a strong magnet, and so should never be brought close to magnetic materials.
2) The pick-up should always be handled correctly and carefully, taking care to avoid external pressure and impact. If it is subjected to strong pressure or impact, the result may be an operational malfunction and/or damage to the printed-circuit board.
3) Each and every pick-up is already individually adjusted to a high degree of precision, and for that reason the adjustment point and installation screws should absolutely never be touched.
4) Laser beams may damage the eyes!
   Absolutely never permit laser beams to enter the eyes!
   Also NEVER switch ON the power to the laser output part (lens, etc.) of the pick-up if it is damaged.



NEVER look directly at the laser beam, and don’t let contact fingers or other exposed skin.

5) Cleaning the lens surface
   If there is dust on the lens surface, the dust should be cleaned away by using an air bush (such as used for camera lens). The lens is held by a delicate spring. When cleaning the lens surface, therefore, a cotton swab should be used, taking care not to distort this.



6) Never attempt to disassemble the pick-up.
   Spring by excess pressure. If the lens is extremely dirty, apply isopropyl alcohol to the cotton swab. (Do not use any other liquid cleaners, because they will damage the lens.) Take care not to use too much of this alcohol on the swab, and do not allow the alcohol to get inside the pick-up.

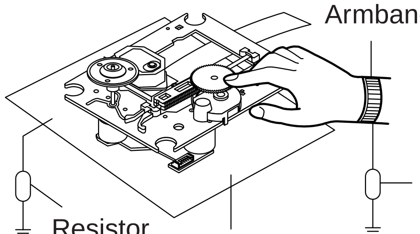
NOTES REGARDING COMPACT DISC PLAYER REPAIRS

1. Preparations

1) Compact disc players incorporate a great many ICs as well as the pick-up (laser diode). These components are sensitive to, and easily affected by, static electricity. If such static electricity is high voltage, components can be damaged, and for that reason components should be handled with care.
2) The pick-up is composed of many optical components and other high-precision components. Care must be taken, therefore, to avoid repair or storage where the temperature of humidity is high, where strong magnetism is present, or where there is excessive dust.

2. Notes for repair

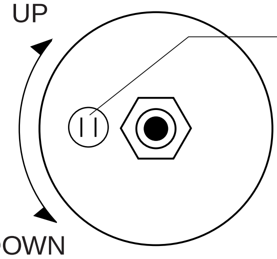
1) Before replacing a component part, first disconnect the power supply lead wire from the unit
2) All equipment, measuring instruments and tools must be grounded.
3) The workbench should be covered with a conductive sheet and grounded.
   When removing the laser pick-up from its conductive bag, do not place the pick-up on the bag. (This is because there is the possibility of damage by static electricity.)
4) To prevent AC leakage, the metal part of the soldering iron should be grounded.
5) Workers should be grounded by an armband (1M Ω)
6) Care should be taken not to permit the laser pick-up to come in contact with clothing, in order to prevent static electricity changes in the clothing to escape from the armband.
7) The laser beam from the pick-up should NEVER be directly facing the eyes or bare skin.



CLEARING MALFUNCTION

You can reset your unit to initial status if malfunction occur(button malfunction, display, etc.).
Using a pointed good conductor(such as driver), simply short the RESET jump wire on the inside of the volume knob for more than 3 seconds.
If you reset your unit, you must reenter all its settings(stations, clock, timer)

NOTE: 1. To operate the RESET jump wire, pull the volume rotary knob and release it.
2. If you wish to operate the RESET jump wire, it is necessary to unplug the power cord.



❑ ESD PRECAUTIONS

Electrostatically Sensitive Devices (ESD)

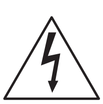
Some semiconductor (solid state) devices can be damaged easily by static electricity. Such components commonly are called Electrostatically Sensitive Devices (ESD). Examples of typical ESD devices are integrated circuits and some field-effect transistors and semiconductor chip components. The following techniques should be used to help reduce the incidence of component damage caused by static electricity.

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any electrostatic charge on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging wrist strap device, which should be removed for potential shock reasons prior to applying power to the unit under test.
2. After removing an electrical assembly equipped with ESD devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.
3. Use only a grounded-tip soldering iron to solder or unsolder ESD devices.
4. Use only an anti-static solder removal device. Some solder removal devices not classified as "anti-static" can generate electrical charges sufficient to damage ESD devices.
5. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ESD devices.
6. Do not remove a replacement ESD device from its protective package until immediately before you are ready to install it. (Most replacement ESD devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive materials).
7. Immediately before removing the protective material from the leads of a replacement ESD device, touch the protective material to the chassis or circuit assembly into which the device will by installed.

CAUTION : BE SURE NO POWER IS APPLIED TO THE CHASSIS OR CIRCUIT, AND OBSERVE ALL OTHER SAFETY PRECAUTIONS.

8. Minimize bodily motions when handing unpackaged replacement ESD devices. (Otherwise harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity sufficient to damage an ESD device).

CAUTION. GRAPHIC SYMBOLS



THE LIGHTNING FLASH WITH APROWHEAD SYMBOL. WITHIN AN EQUILATERAL TRIANGLE, IS INTENDED TO ALERT THE SERVICE PERSONNEL TO THE PRESENCE OF UNINSULATED “DANGEROUS VOLTAGE” THAT MAY BE OF SUFFICIENT MAGNITUDE TO CONSTITUTE A RISK OF ELECTRIC SHOCK.



THE EXCLAMATION POINT WITHIN AN EQUILATERAL TRIANGLE IS INTENDED TO ALERT THE SERVICE PERSONNEL TO THE PRESENCE OF IMPORTANT SAFETY INFORMATION IN SERVICE LITERATURE.

❑ SPECIFICATIONS

[General]		Power supply	Refer to the back panel of the unit.
		Power consumption	20W
		Mass	6.6 lb
		External dimensions (WxHxD)	5.74 X 9.21 X 9.88 inch
[CD]		Frequency response	40 - 18000 Hz
		Signal-to-noise ratio	60 dB
		Dynamic range	60 dB
[Tuner]	FM	Tuning Range	87.5 - 108.0 MHz
		Intermediate Frequency	10.7 MHz
		Signal to Noise Ratio	55/50 dB
		Frequency Response	60 - 10000 Hz
	AM (MW)	Tuning Range	530 - 1720 kHz
		Intermediate Frequency	450 kHz
		Signal to Noise Ratio	35 dB
		Frequency Response	100 - 1800 Hz
[Amp]		Output Power	5W + 5W
		T.H.D	0.5%
		Frequency Response	60 - 20000 Hz
		Signal-to-noise ratio	60 dB
[TAPE]		Tape Speed	4.75cm/sec
		Wow Flutter	0.25% (MTT -111, JIS-WTD)
		F.F/REW Time	120sec (C-60)
		Frequency Response	250 - 8000Hz
		Signal to Noise Ratio	43dB
		Channel Separation	50dB(P/B)/45dB(R/P)
		Erase Ratio	55dB (MTT-5511)
[Speakers]		Type	1 Way 1 Speaker
		Impedance	4
		Frequency Response	100 - 18000 Hz
		Sound Pressure Level	88 dB/W (1m)
		Rated Input Power	5W
		Max. Input Power	10W
		Net Dimensions (WxHxD)	5.74 x 9.21 x 7.16 inch
		Net Weight (1EA)	3.0 lb

Designs and specifications are subject to change without notice.

MEMO

SECTION 2. ELECTRICAL

❑ ADJUSTMENTS

This set has been aligned at the factory and normally will not require further adjustment. As a result, it is not recommended that any attempt is made to modificate any circuit. If any parts are replaced or if anyone tampers with the adjustment, realignment may be necessary.

IMPORTANT

1. Check Power-source voltage.
2. Set the function switch to band being aligned.
3. Turn volume control to minimum unless otherwise noted.
4. Connect low side of signal source and output indicator to chassis ground unless otherwise specified.
5. Keep the signal input as low as possible to avoid AGC and AC action.

TAPE DECK ADJUSTMENT

1. AZIMUTH ADJUSTMENT

Deck Mode	Test Tape	Test Point	Adjustment	Adjust for
Palyback	MTT-114	Speaker Out	DECK Screw Azimuth Screw	Maximum

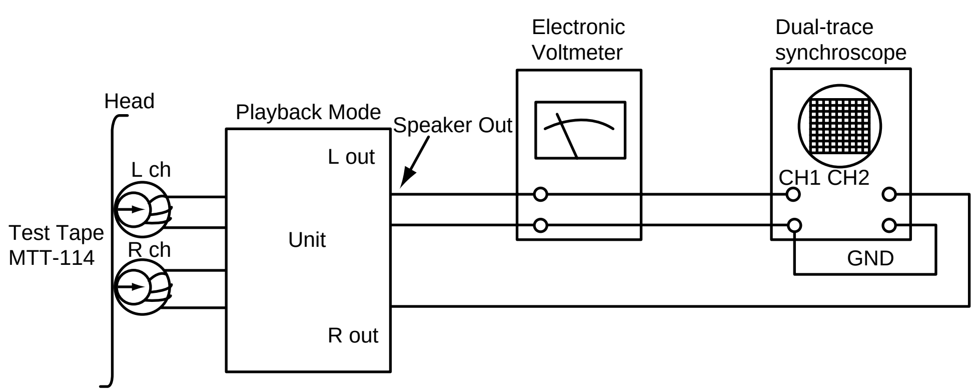


Figure 1. Azimuth Adjustment Connection Diagram

2. TUNER ADJUSTMENT

Item	Test Point	Adjustment	Adjust for
DC Voltage	Check point TP1, TP2	DECK Screw	0V ± 50mV

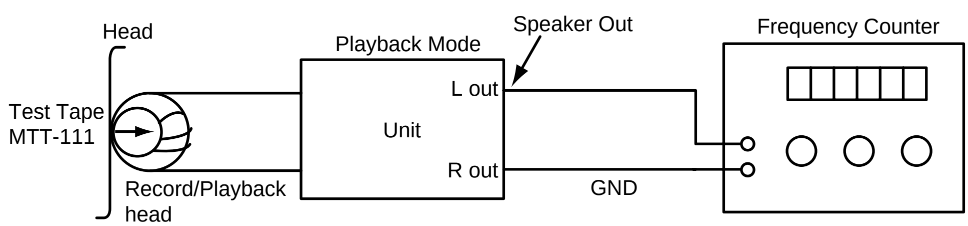
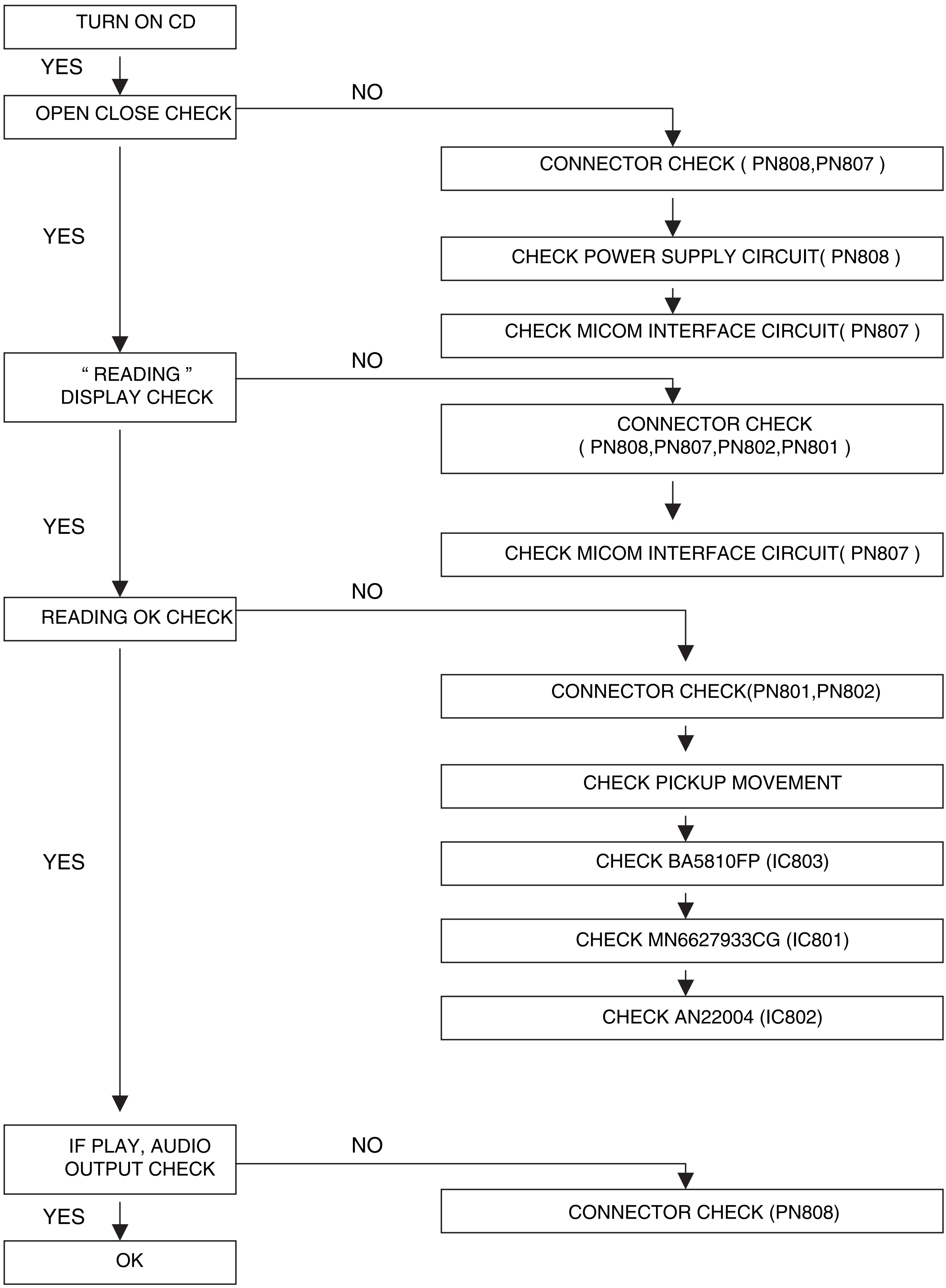


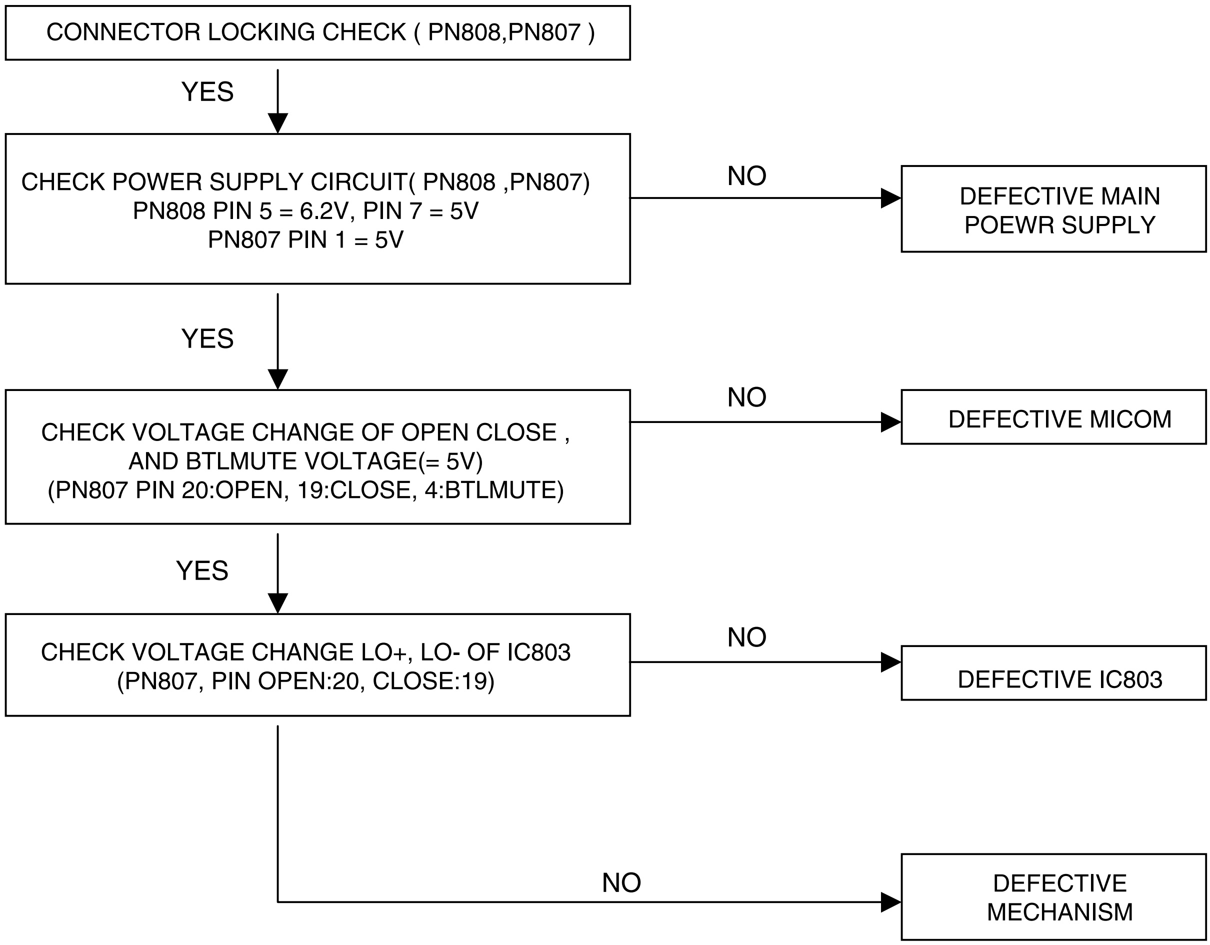
Figure 1. Azimuth Adjustment Connection Diagram

❑ TROUBLESHOOTING

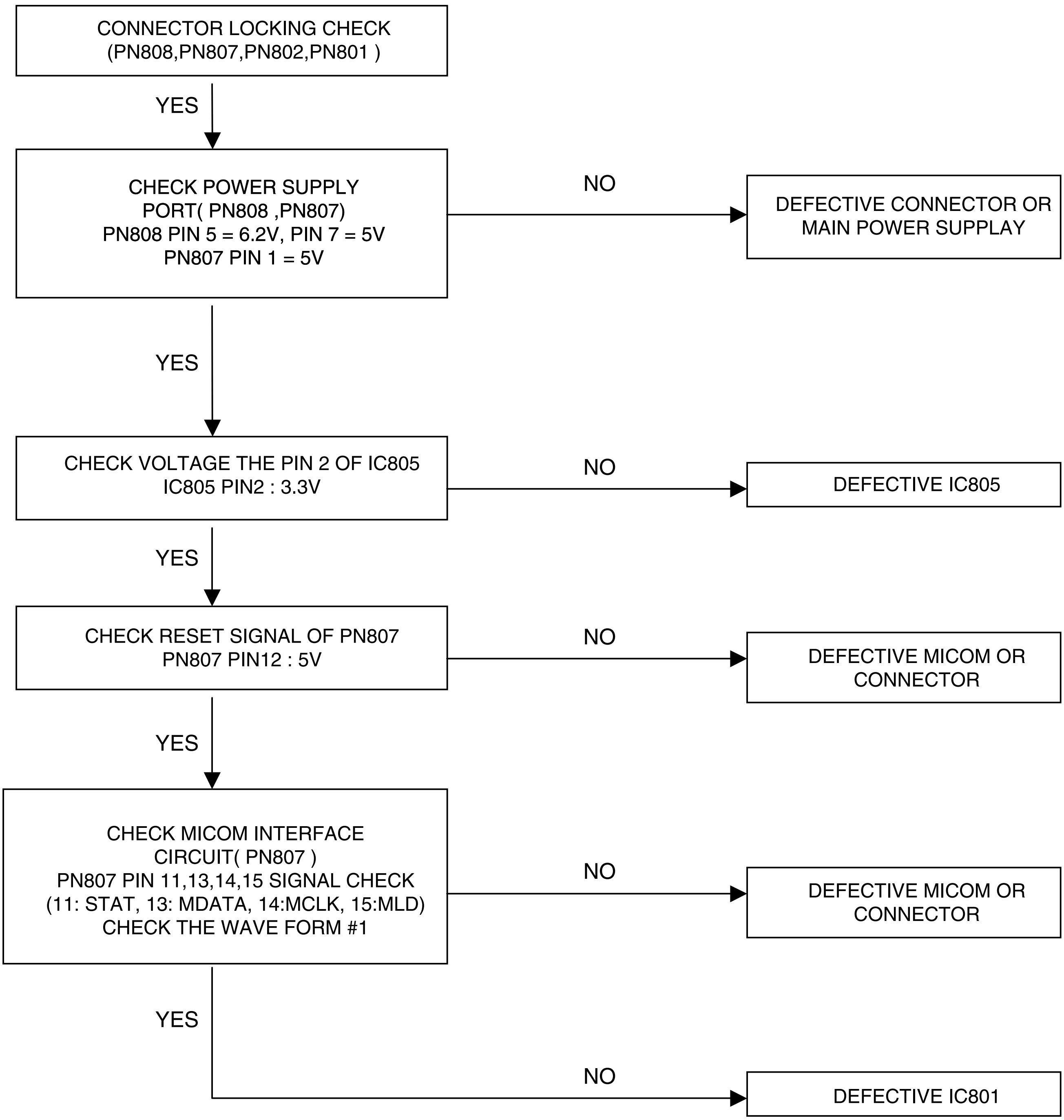
• CD PART



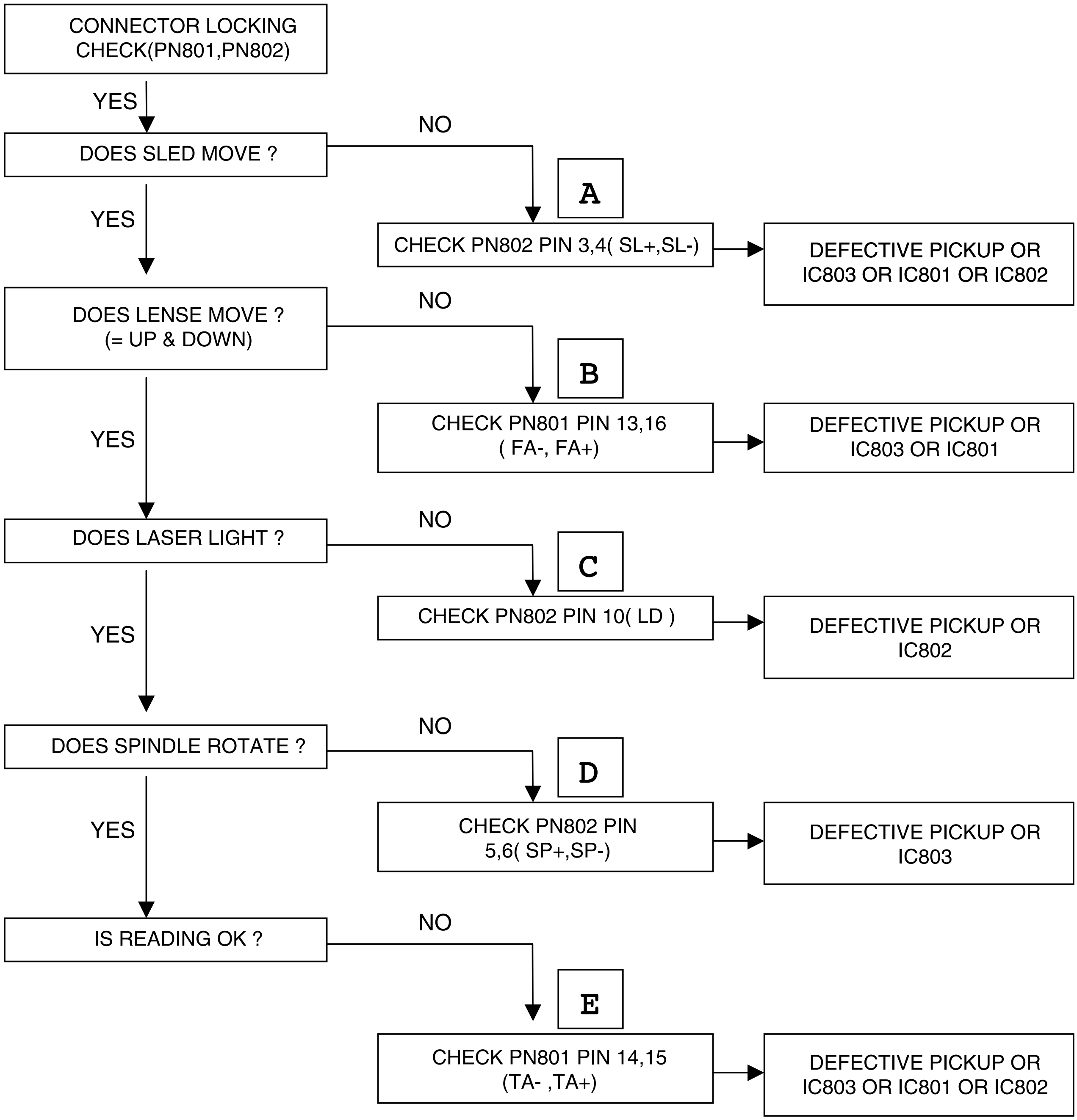
• OPEN CLOSE NG



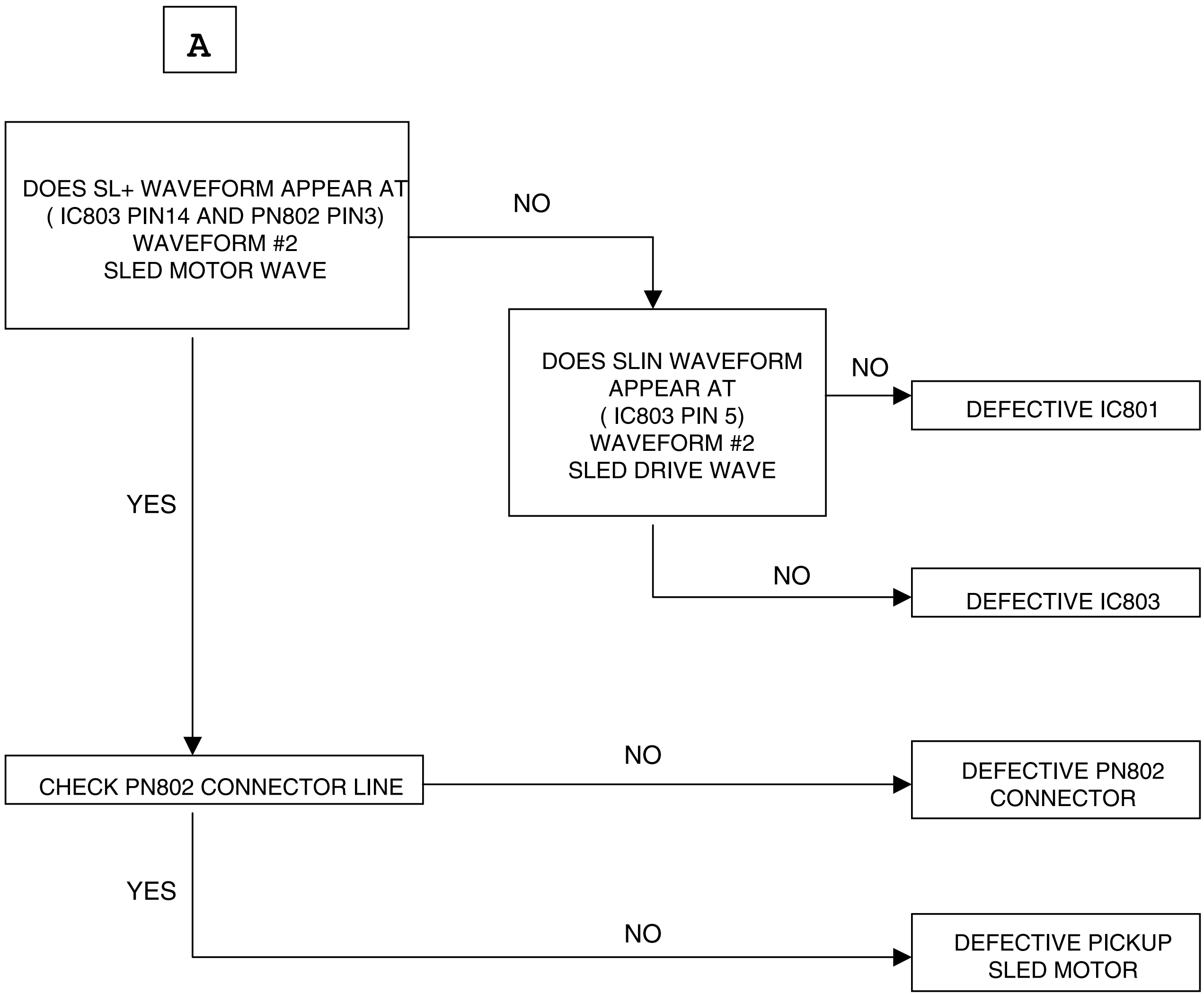
• “ READING ” DISPLAY CHECK (= ONLY “CD “DISPLAY)



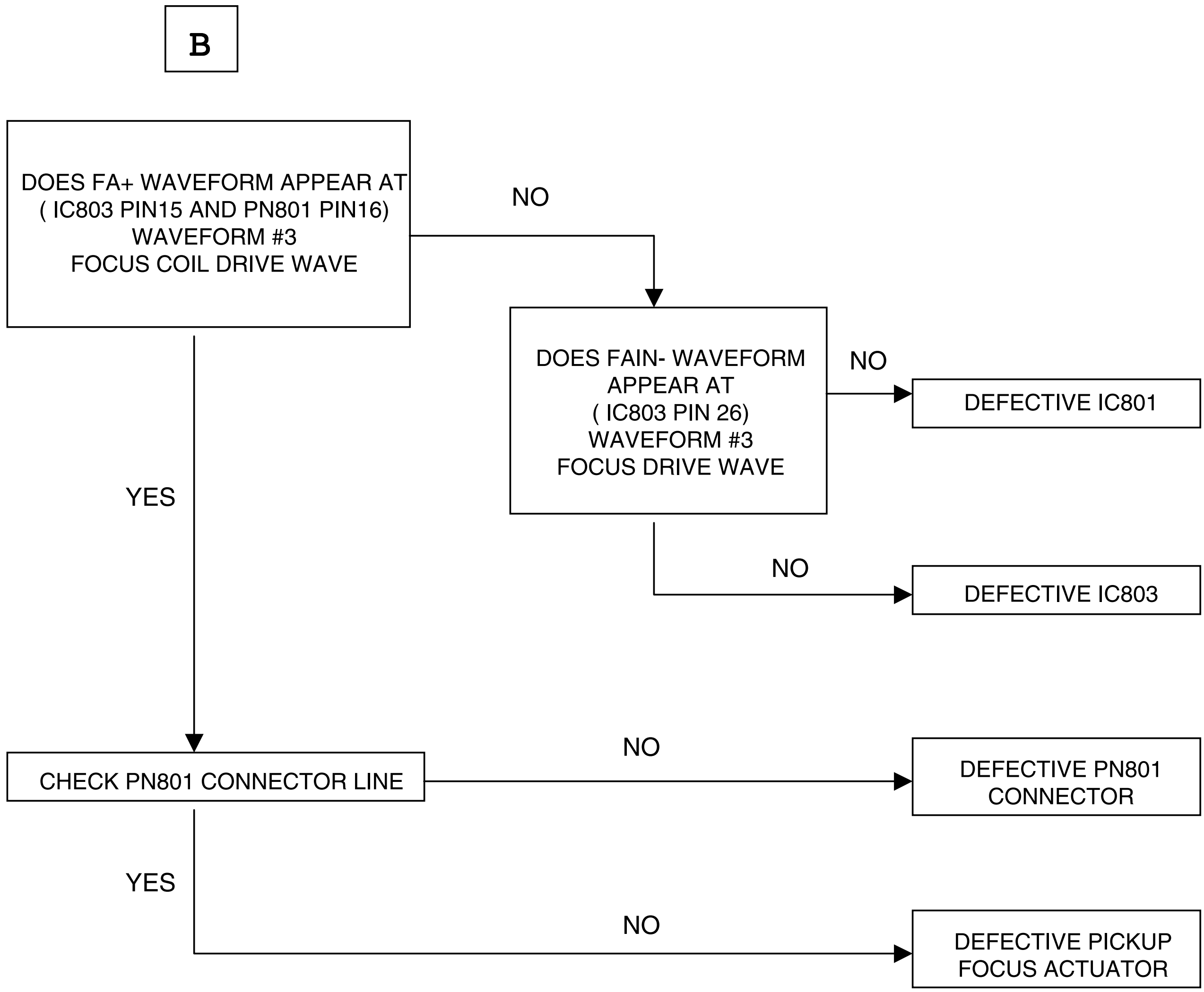
• READING OK CHECK
(= “NO DISC” DISPLAY)



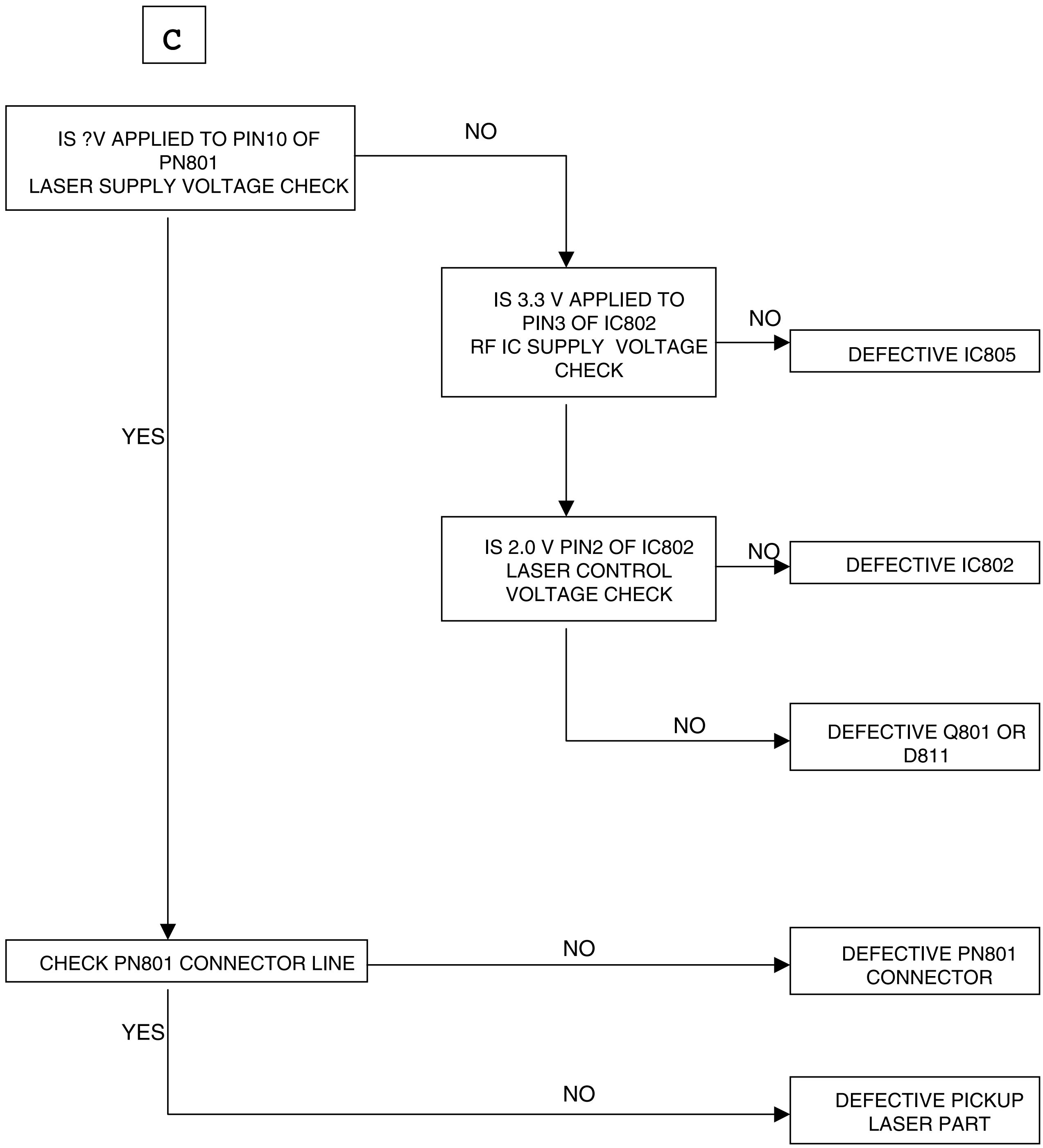
• READING OK CHECK #A (= “NO DISC” DISPLAY)



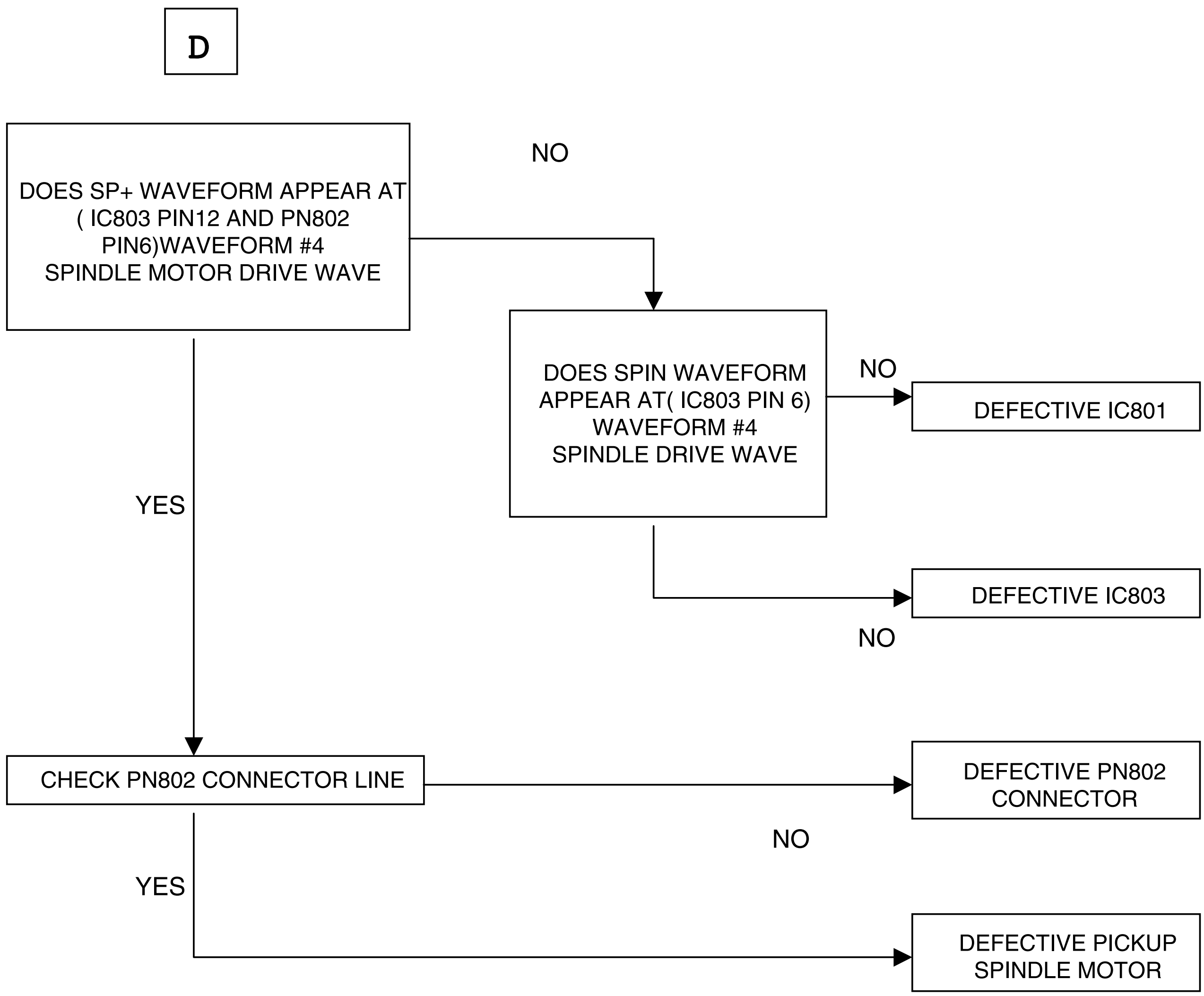
• READING OK CHECK #B (= “NO DISC” DISPLAY)



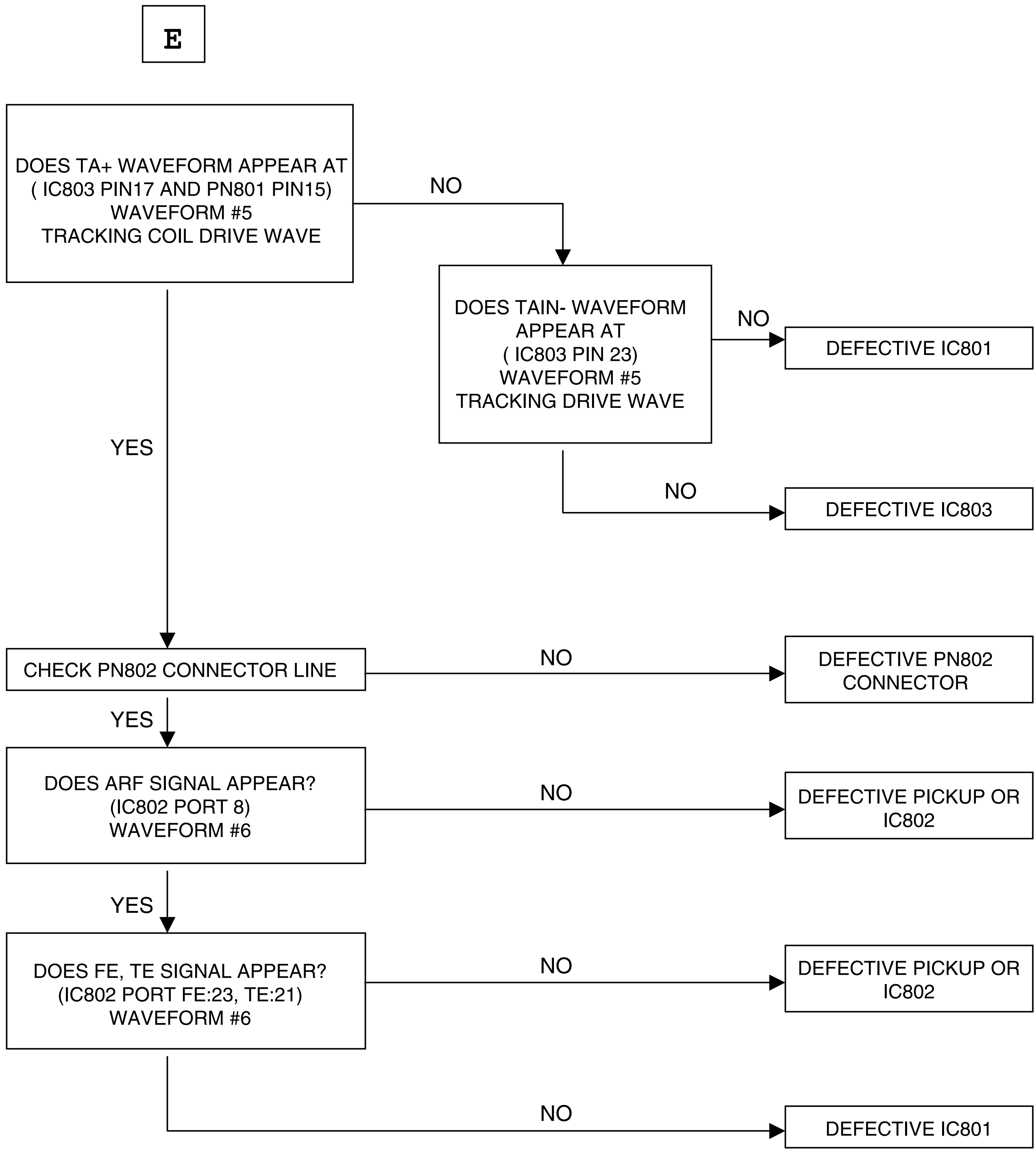
• READING OK CHECK #C (= "NO DISC" DISPLAY)



• READING OK CHECK #D
(= “NO DISC” DISPLAY)

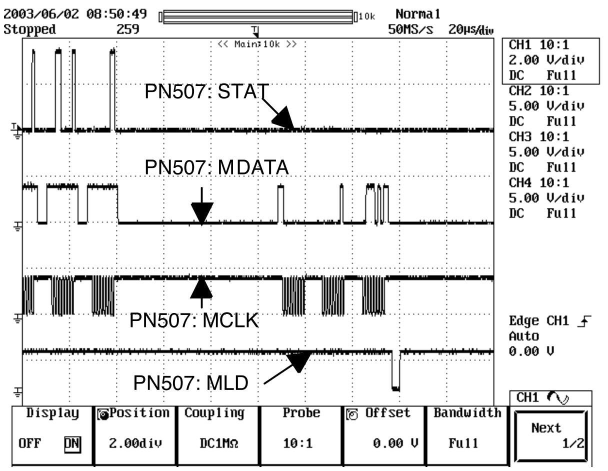


• READING OK CHECK # E (= “NO DISC” DISPLAY)

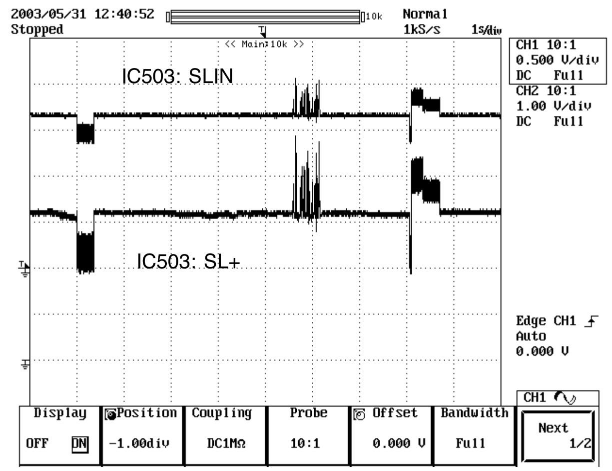


❑ WAVEFORMS OF MAKOR CHECK POINT

#1 . MICOM INTERFACE WAVEFORM
(PN507 pin6, 8, 9, 1 0) during normal play

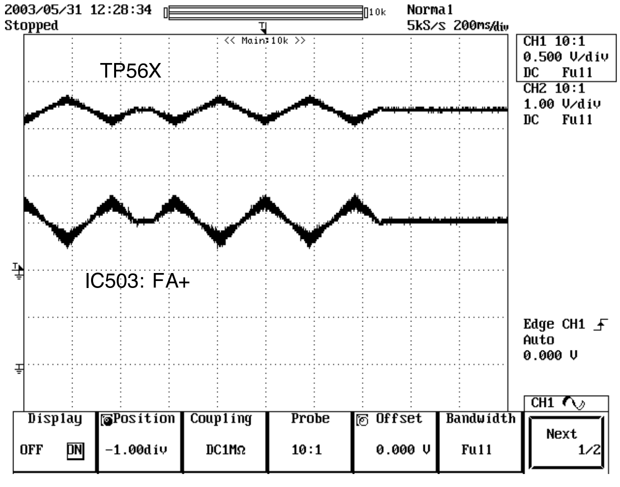


#2. SLED DRIVE AND MOTOR WAVEFORM
(IC503 pin5, 1 4) when focus search

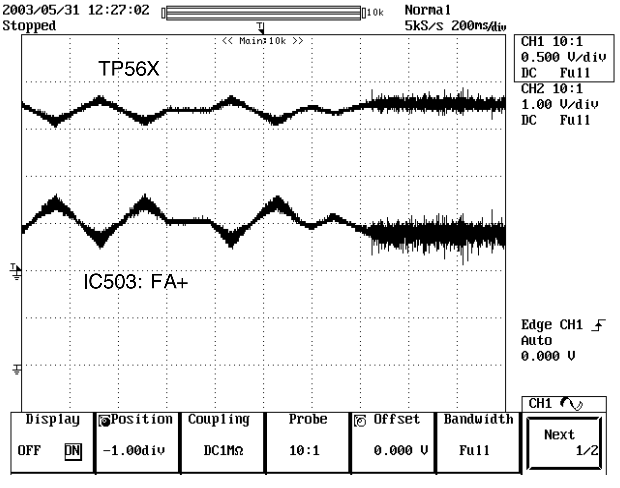


#3. FOCUS DRIVE AND MOTOR WAVEFORM
(TP56 1 , IC503 pin 1 5)

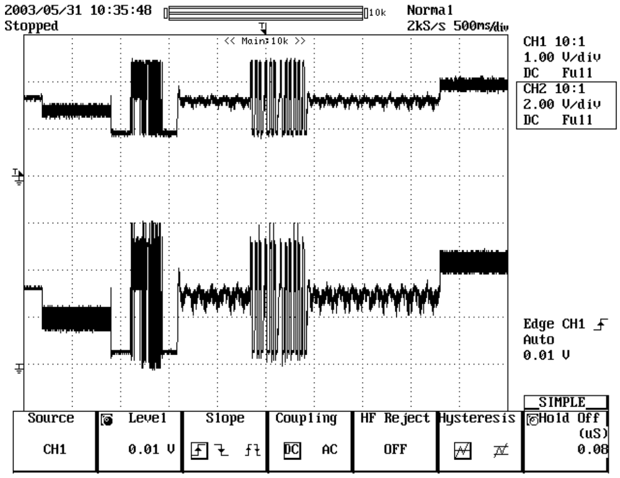
- When focus search failed or there is no disc on tray



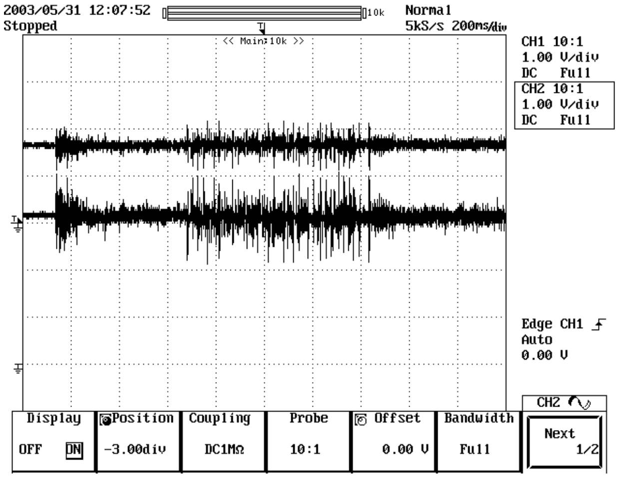
- There is disc on tray and focus search success



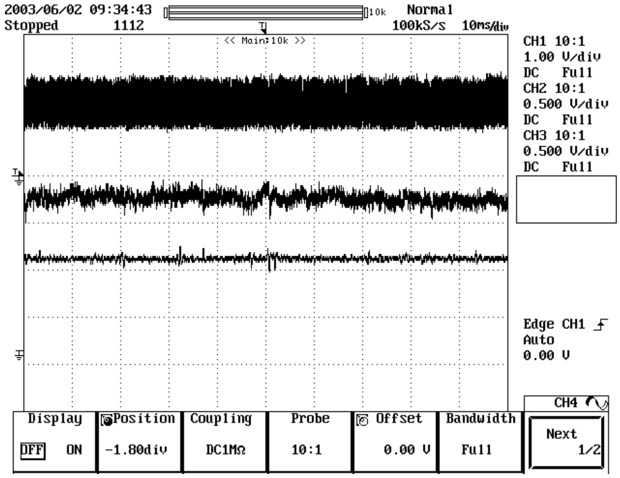
#4. SPINDLE DRIVE AND MOTOR WAVEFORM
(IC503 pin6, 1 2) when TOC reading



#5. TRACK DRIVE AND MOTOR WAVEFORM
(TP560, IC503 pin23) during normal play

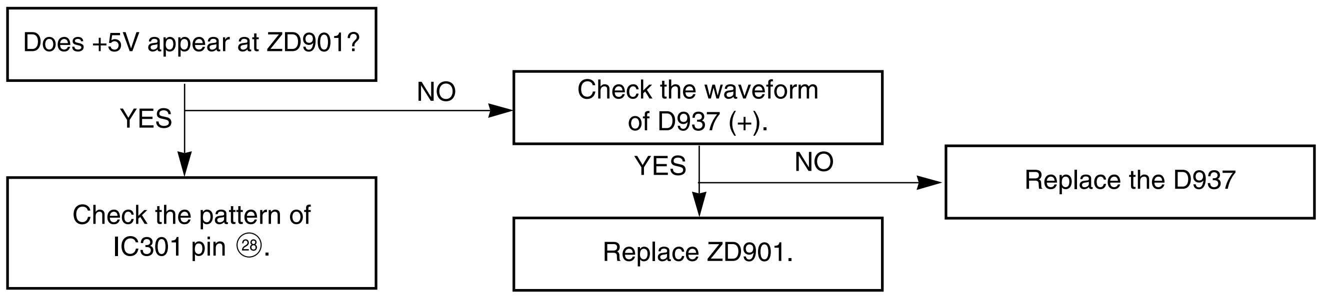


#6. RF, TRACKING AND FOCUS ERROR WAVEFORM
(IC502 pin8, 2 1 , 23) during normal play

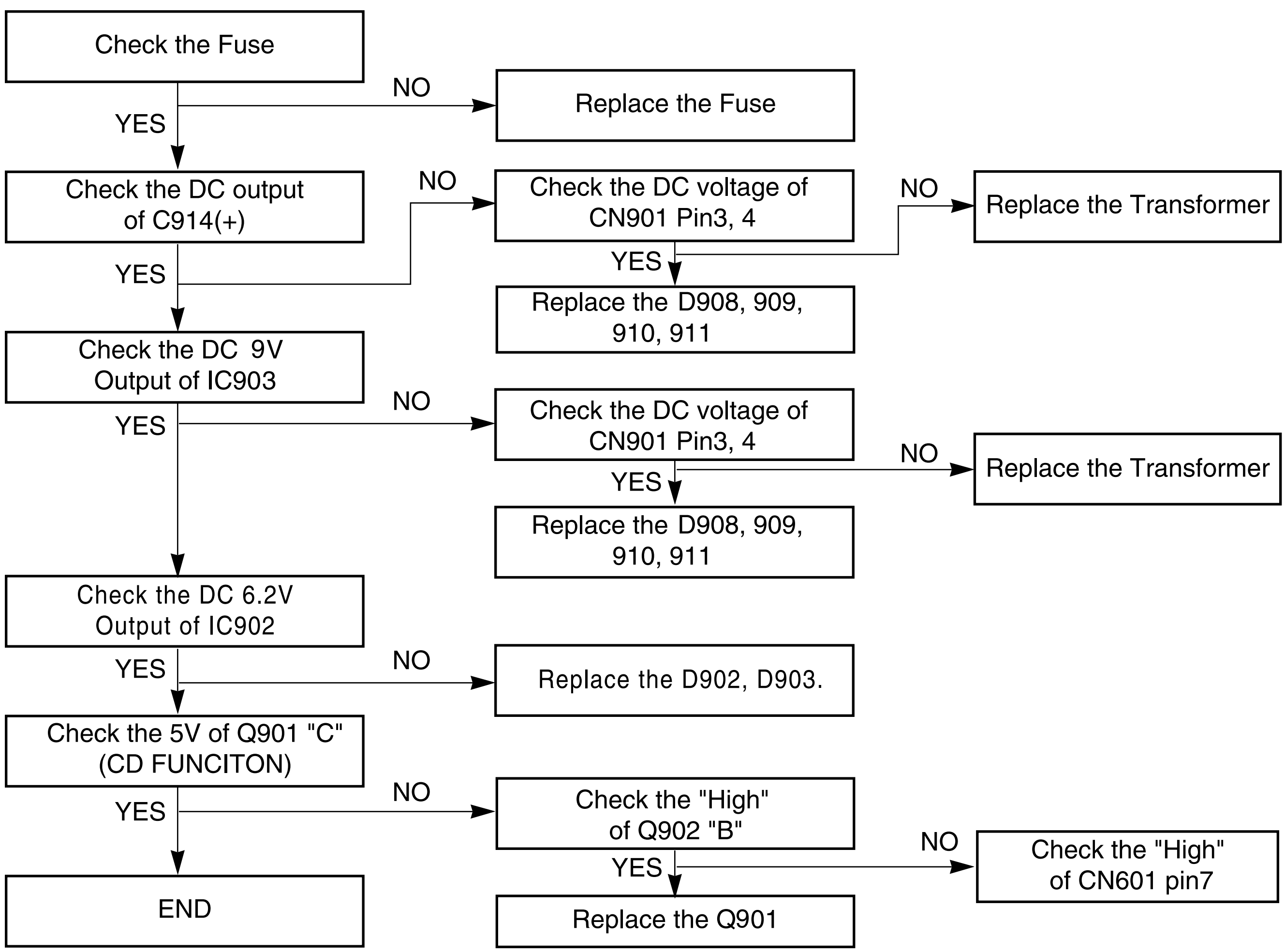


❏ AUDIO PART

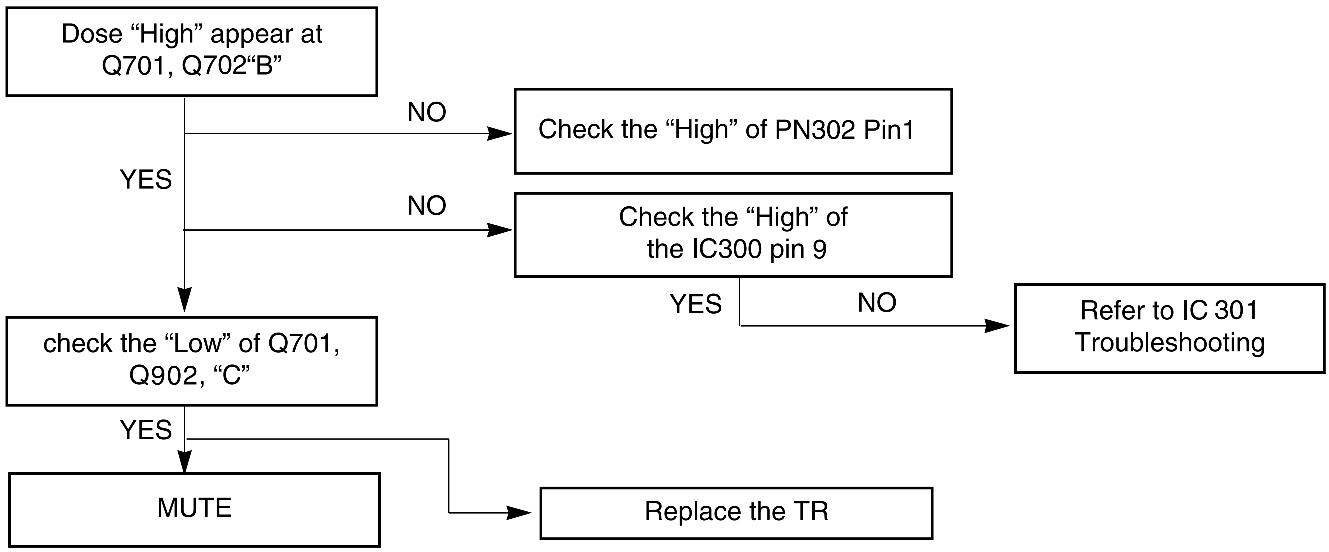
P-SENS PART



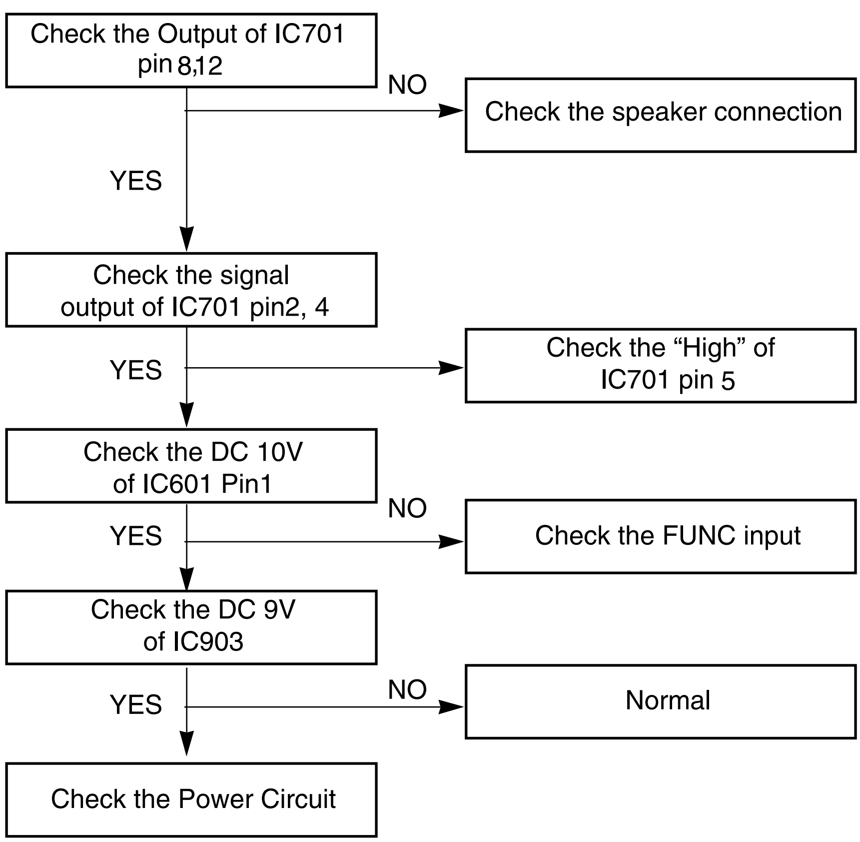
POWER CIRCUIT



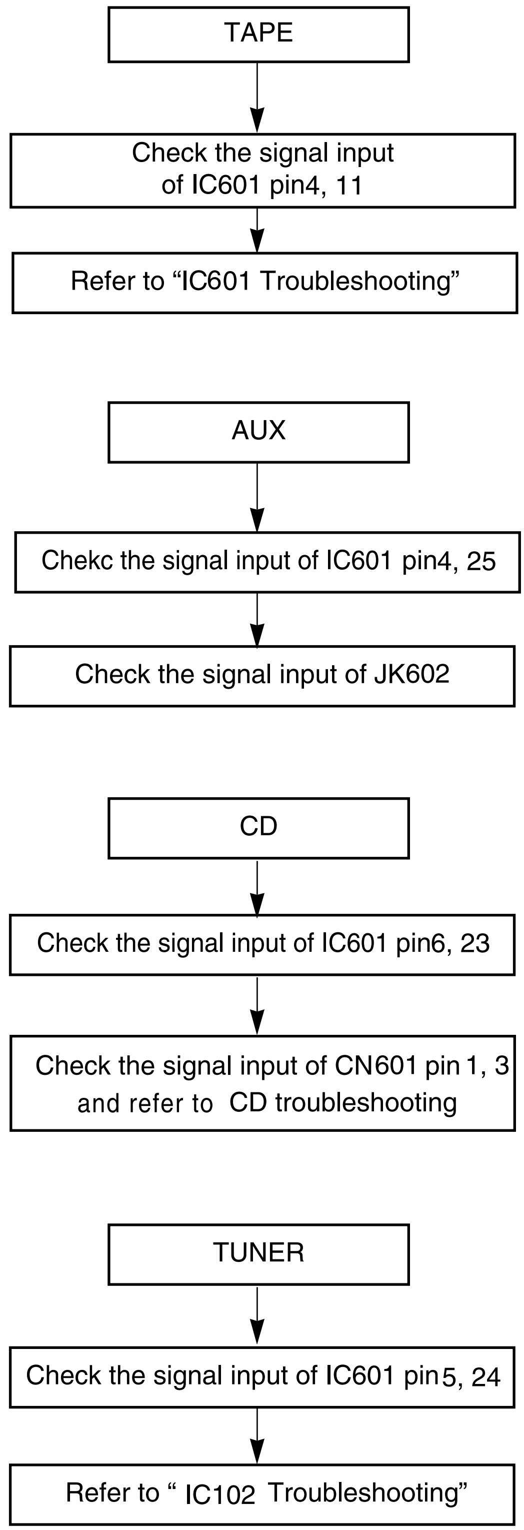
MUTING CIRCUIT (MUTE)



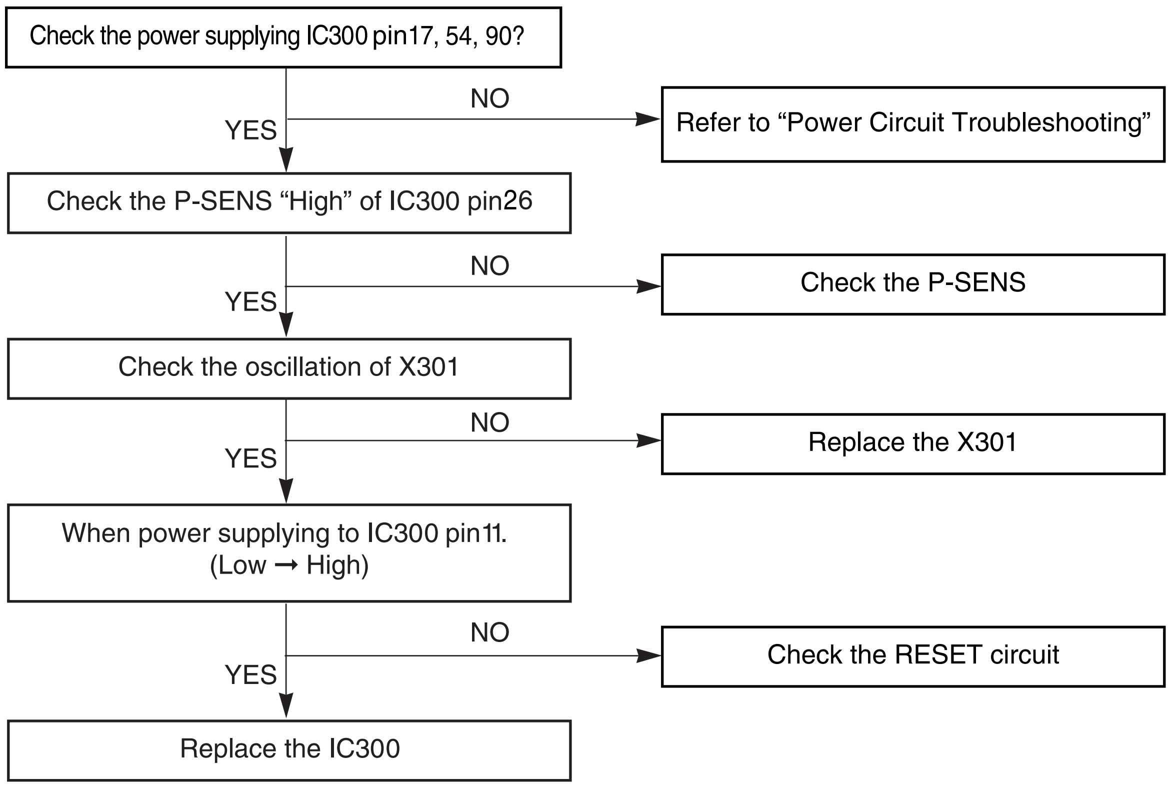
AUDIO ABNORMAL



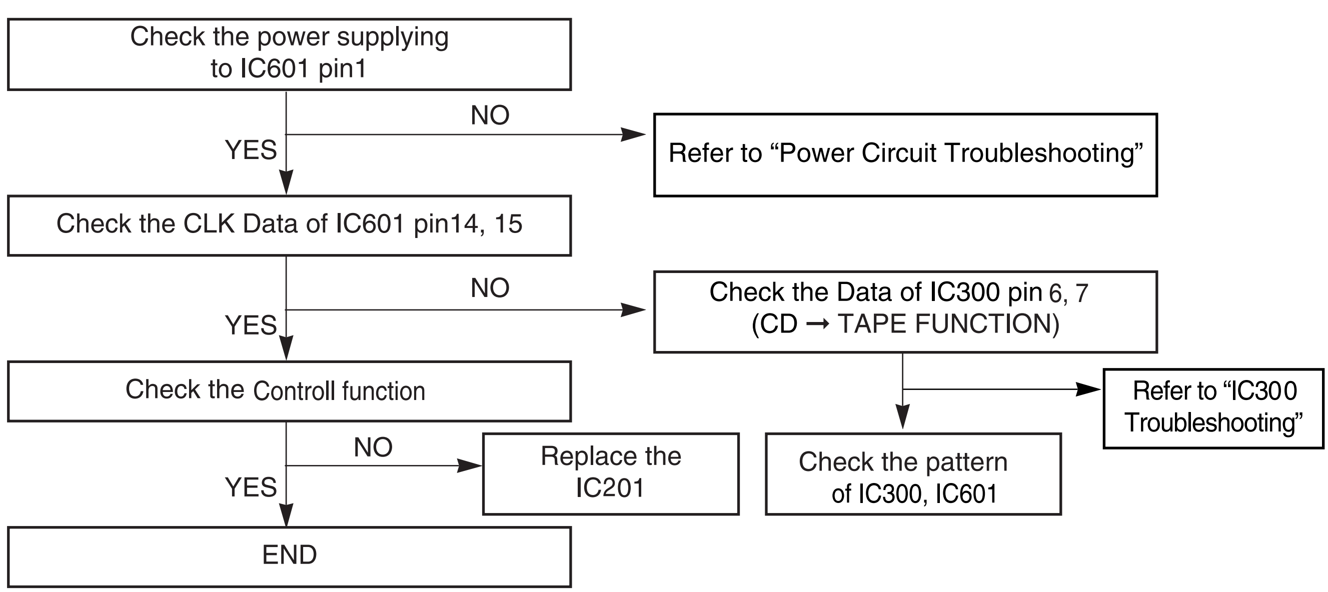
FUNCTION MODE AUDIO ABNORMAL



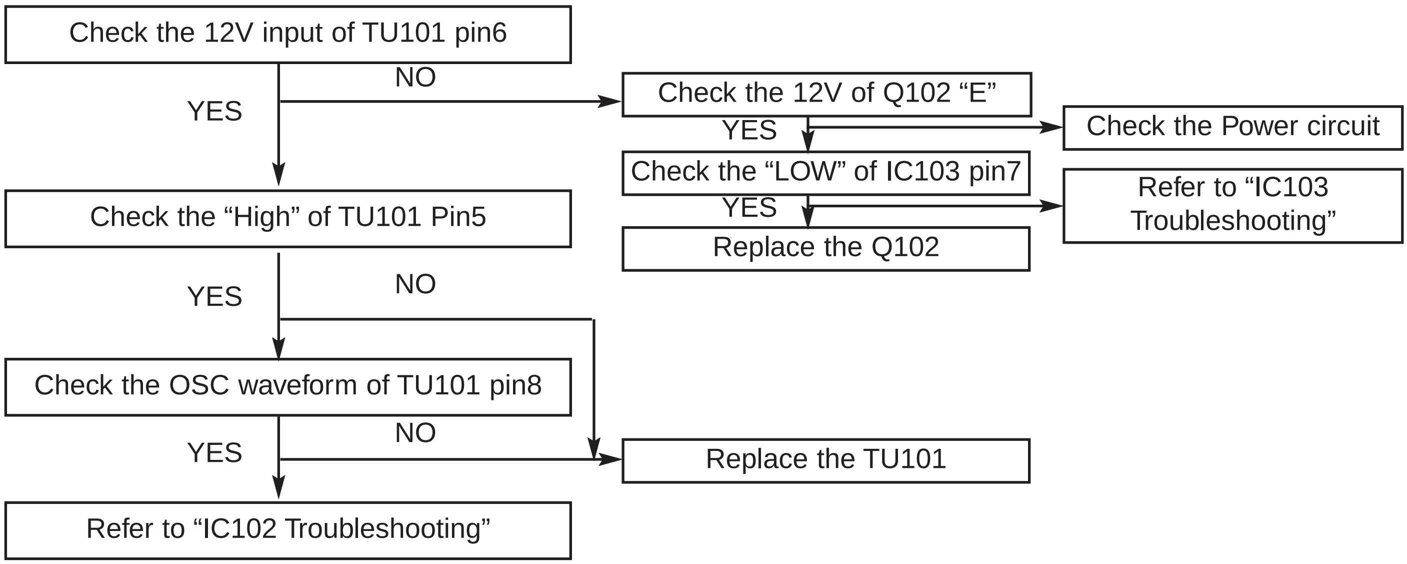
IC301 TROUBLESHOOTING



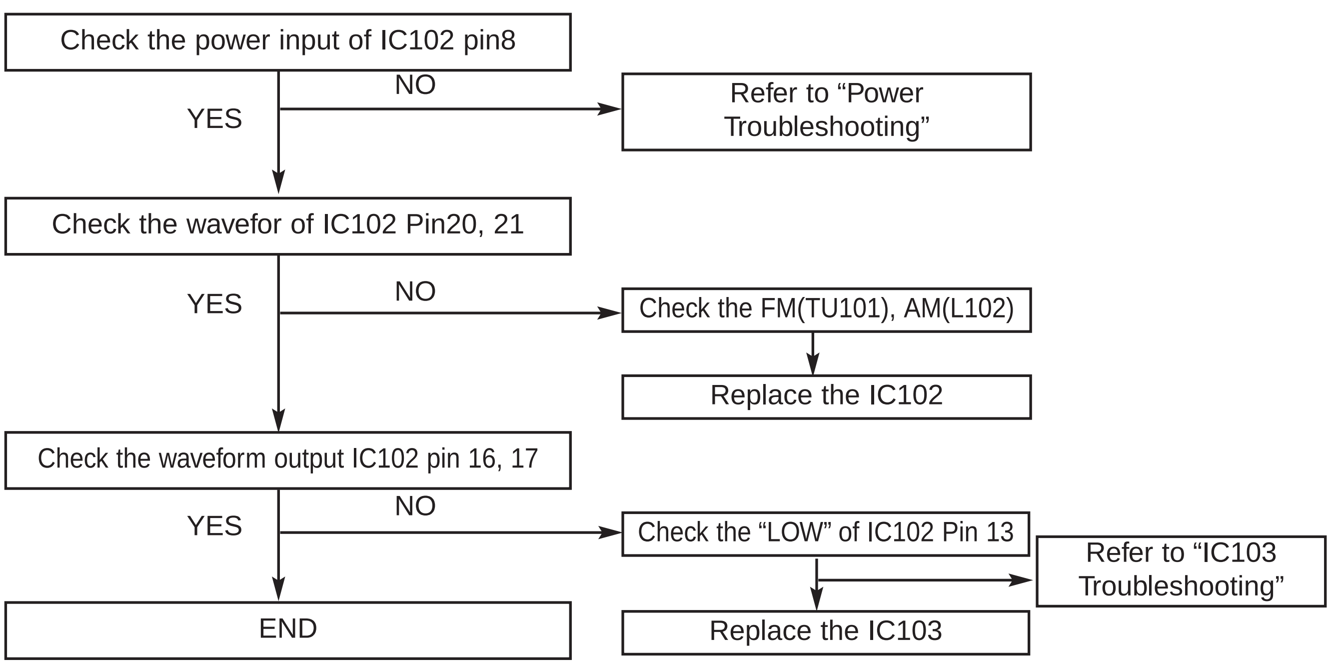
IC601 TROUBLESHOOTING



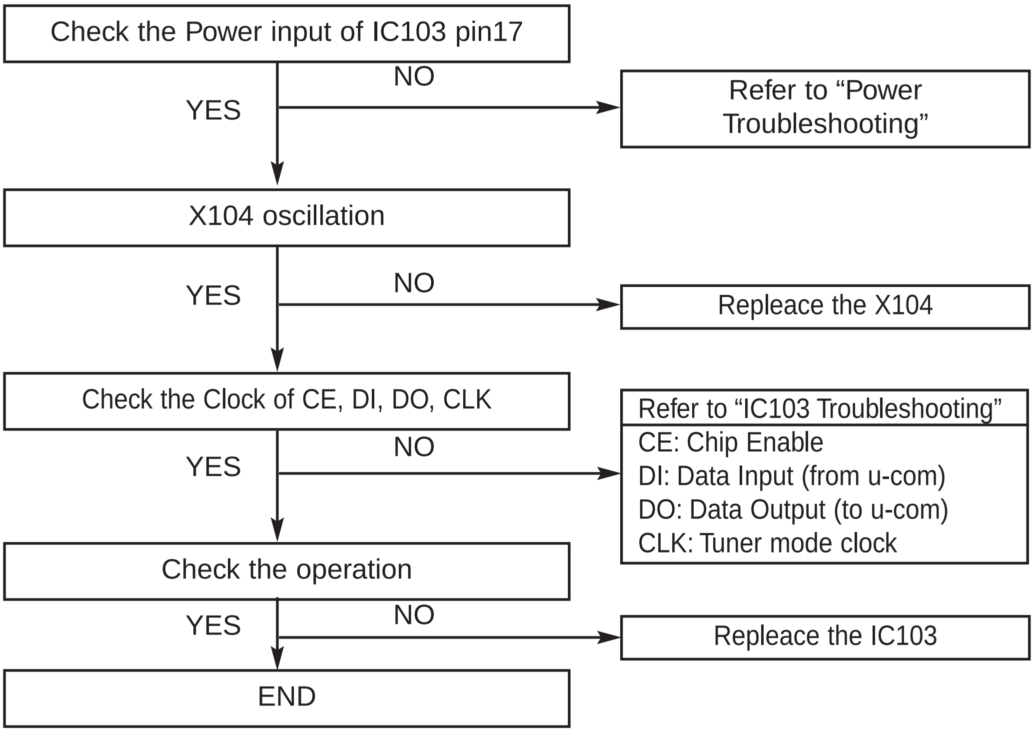
FM(TU101) Troubleshooting



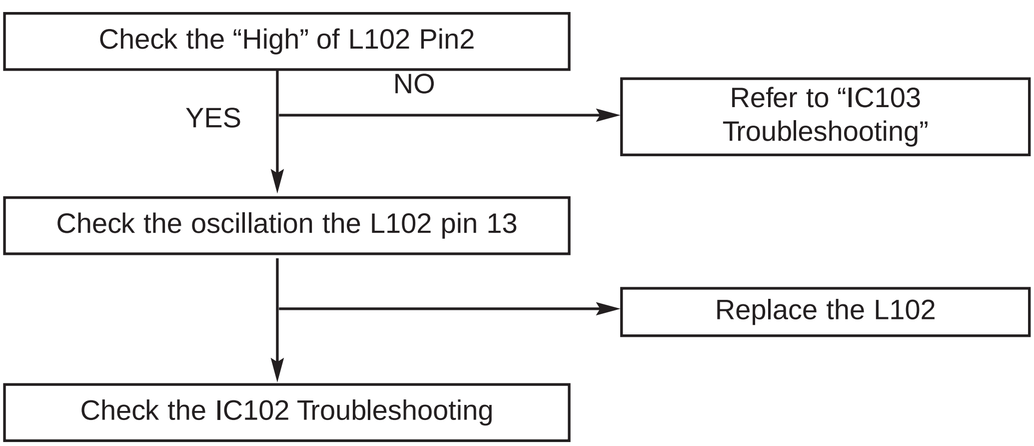
IC102 Troubleshooting



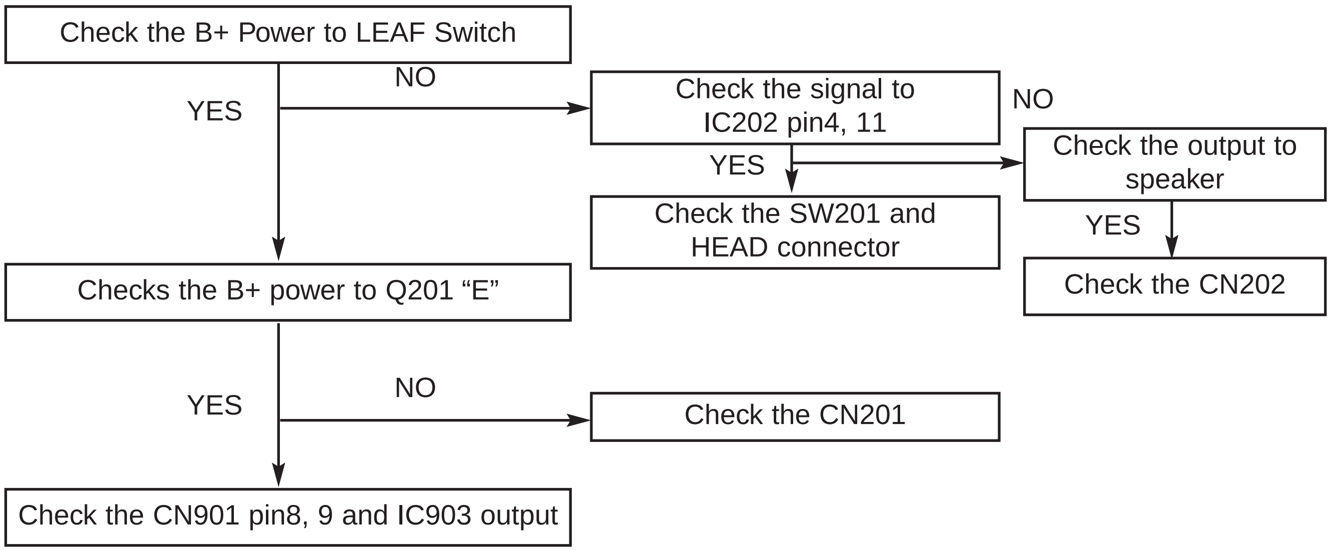
IC103 Troubleshooting



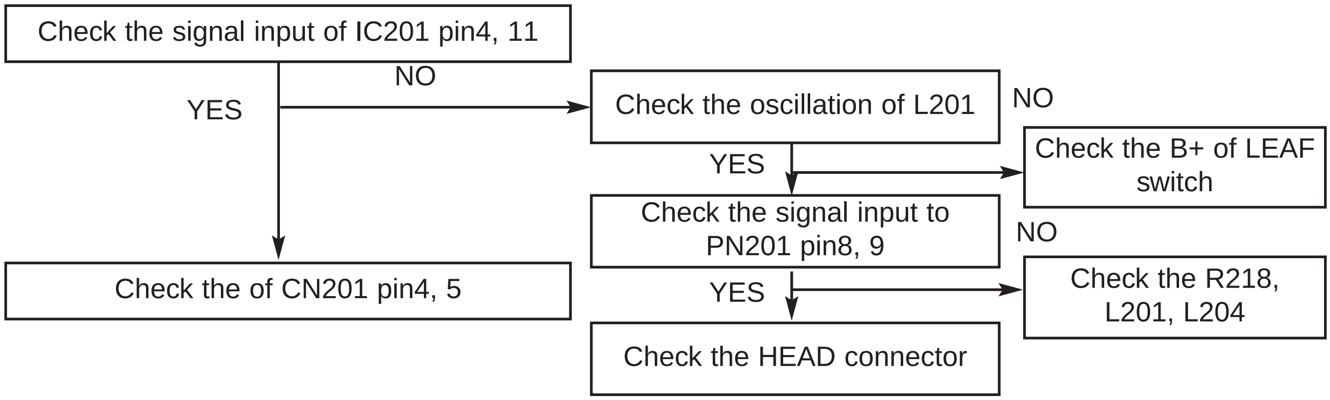
AM COIL Troubleshooting



PLAY

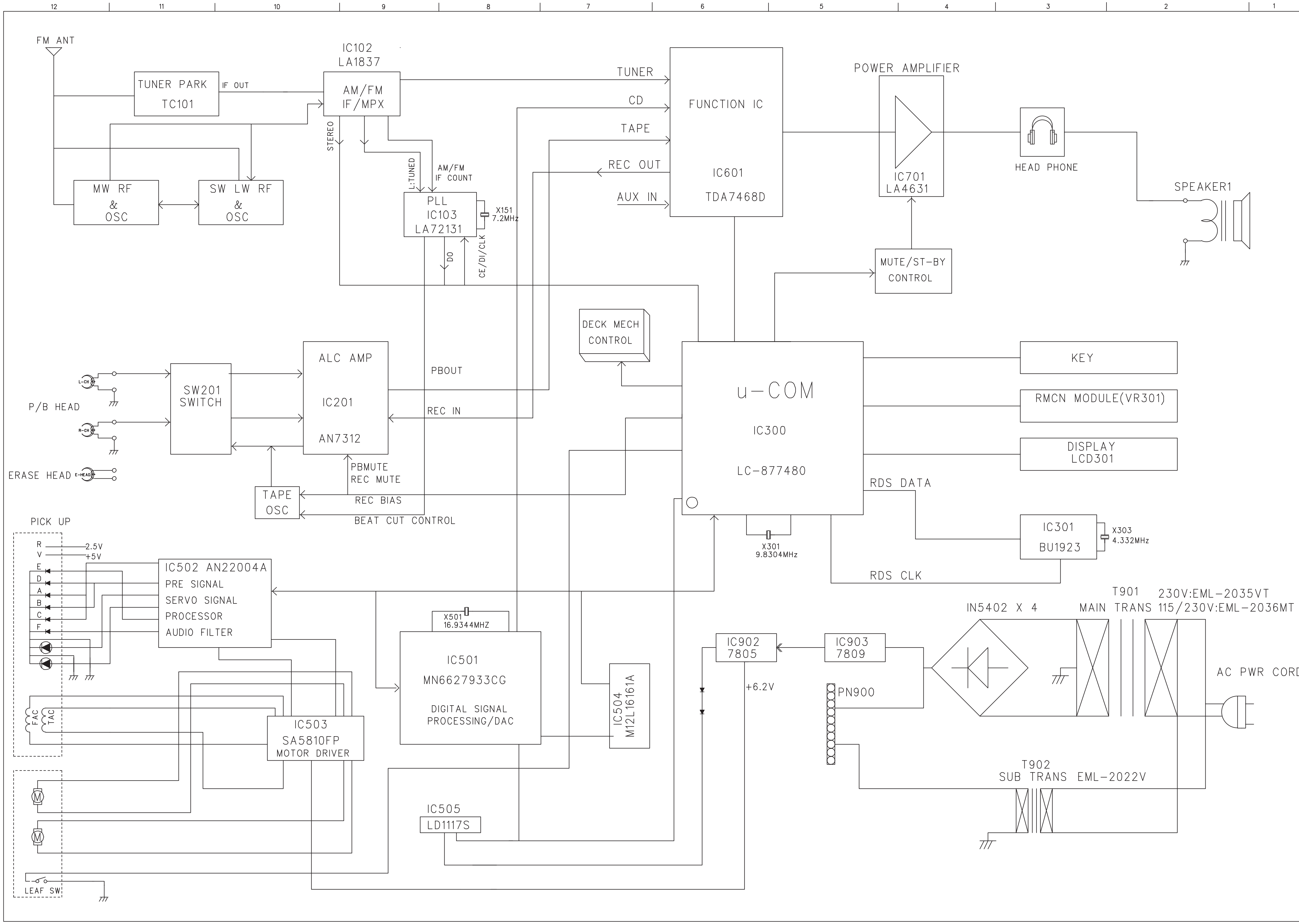

Check the B+ Power to LEAF Switch
NO
YES
Check the signal to IC202 pin4, 11
NO
Check the output to speaker
YES
Check the SW201 and HEAD connector
YES
Check the CN202
Checks the B+ power to Q201 “E”
NO
YES
Check the CN201
Check the CN901 pin8, 9 and IC903 output

REC


Check the signal input of IC201 pin4, 11
NO
YES
Check the oscillation of L201
NO
Check the B+ of LEAF switch
YES
Check the signal input to PN201 pin8, 9
NO
Check the R218, L201, L204
YES
Check the of CN201 pin4, 5
Check the HEAD connector

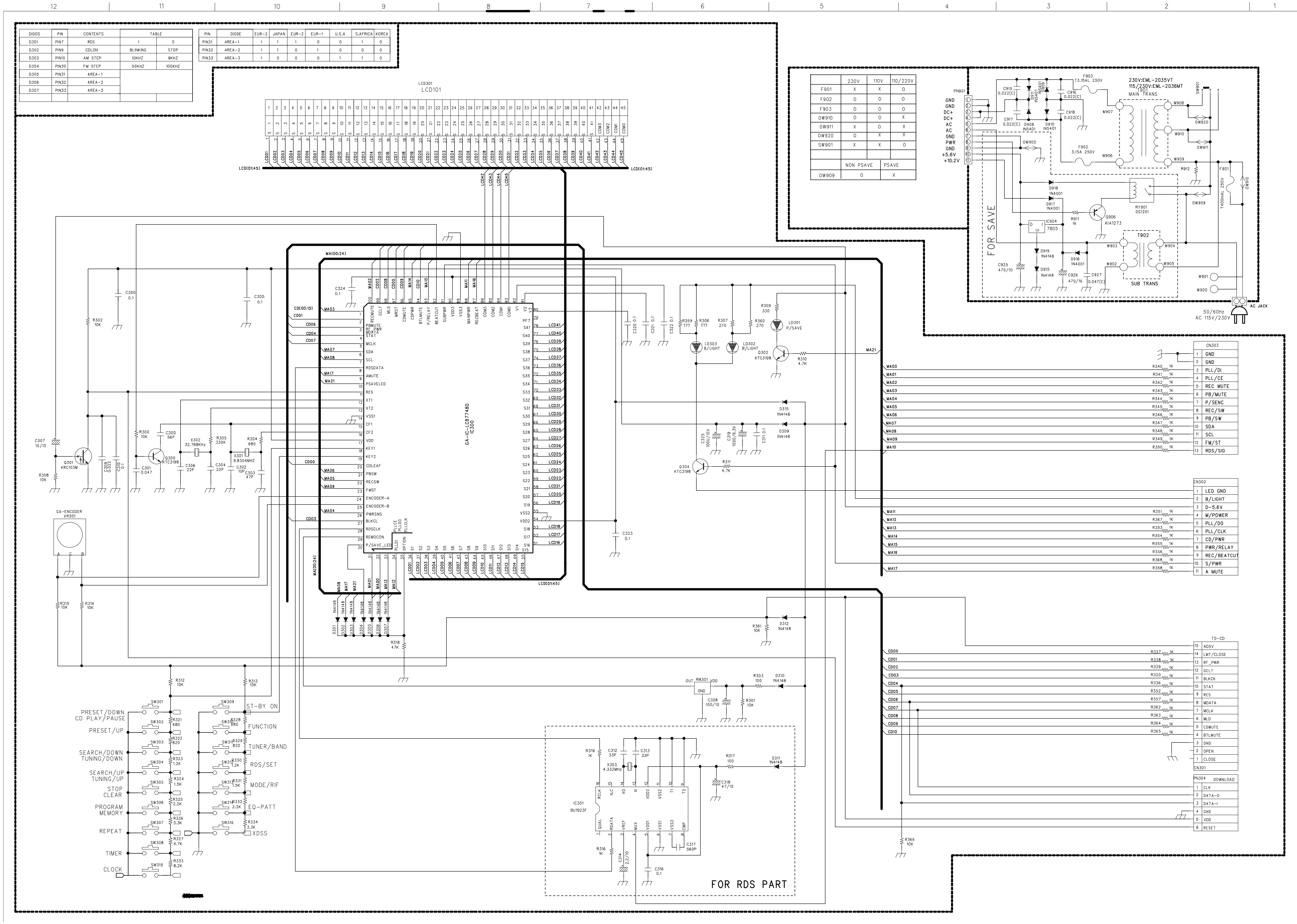
MEMO

❑ BLOCK DIAGRAM



❑ SCHEMATIC DIAGRAMS

• FRONT/POWER SCHEMATIC DIAGRAM



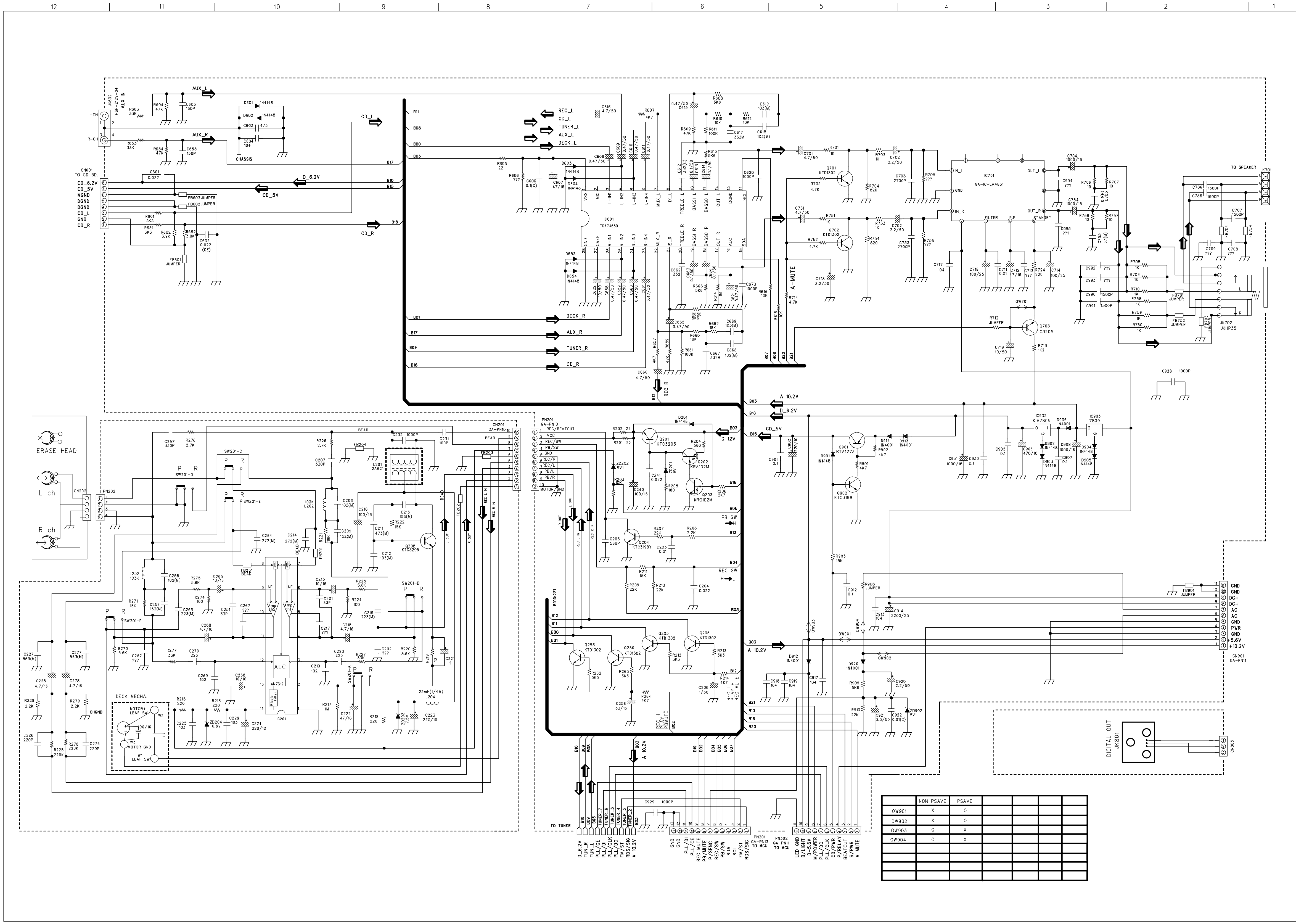
DIDOS	PIN	CONTENTS	TABLE	
D301	PIN7	RDS	1	0
D302	PIN9	CDLON	BLINKING	STOP
D303	PIN10	AM STEP	10KHZ	9KHZ
D304	PIN30	FM STEP	50KHZ	100KHZ
D305	PIN31	AREA-1		
D306	PIN32	AREA-2		
D307	PIN33	AREA-3		

PIN	DIODE	EUR-3	JAPAN	EUR-2	EUR-1	U.S.A	S.AFRICA	KOREA
PIN31	AREA-1	1	1	1	0	0	1	0
PIN32	AREA-2	1	1	0	1	0	0	0
PIN33	AREA-3	1	0	0	0	1	1	0

	230V	110V	110/220V
F901	X	X	O
F902	O	O	O
F903	O	O	O
OW910	O	O	X
OW911	X	O	X
OW920	O	X	X
SW901	X	X	O

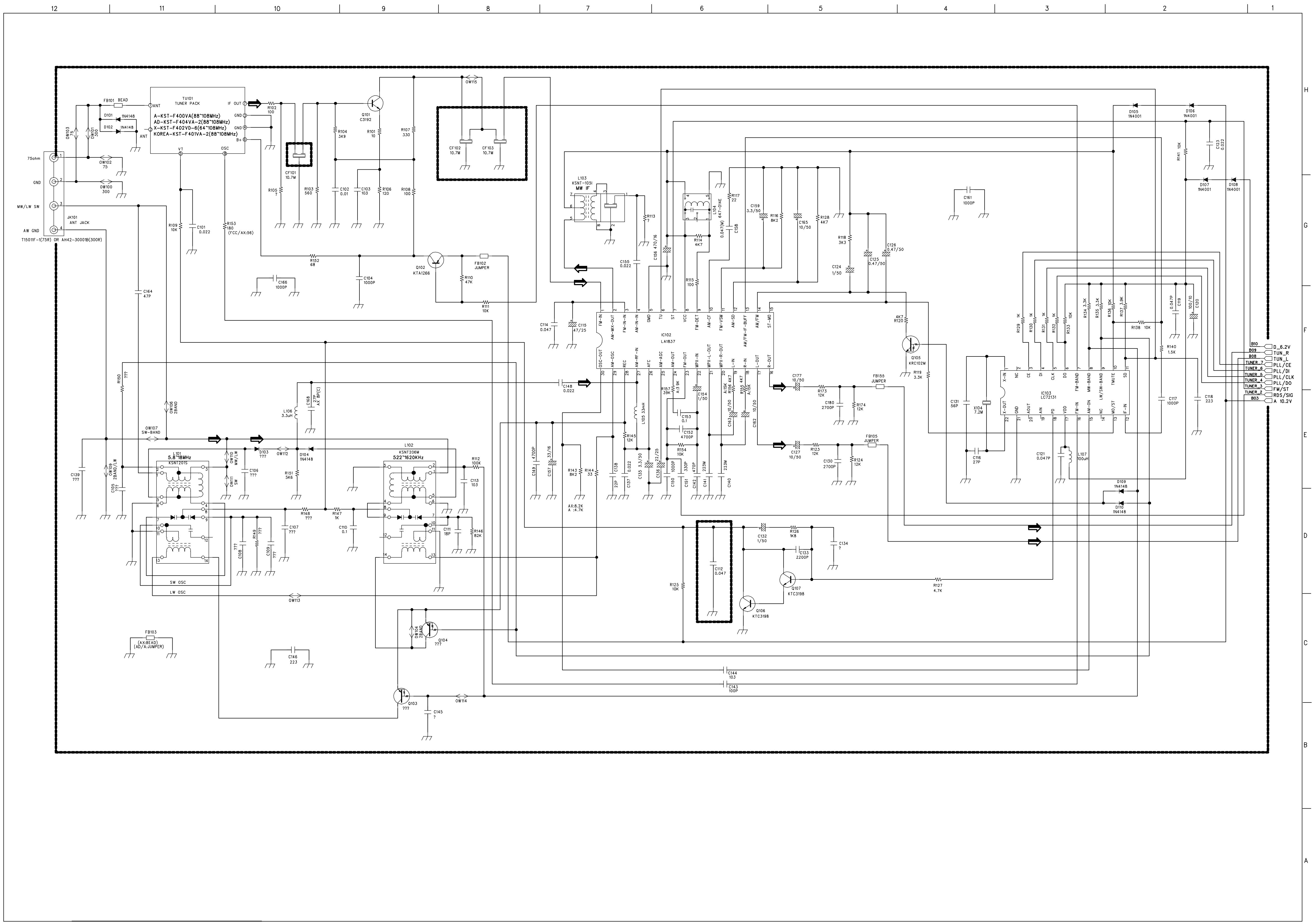
	NON PSAVE	PSAVE
OW909	O	X

• MAIN/DECK SCHEMATIC DIAGRAM

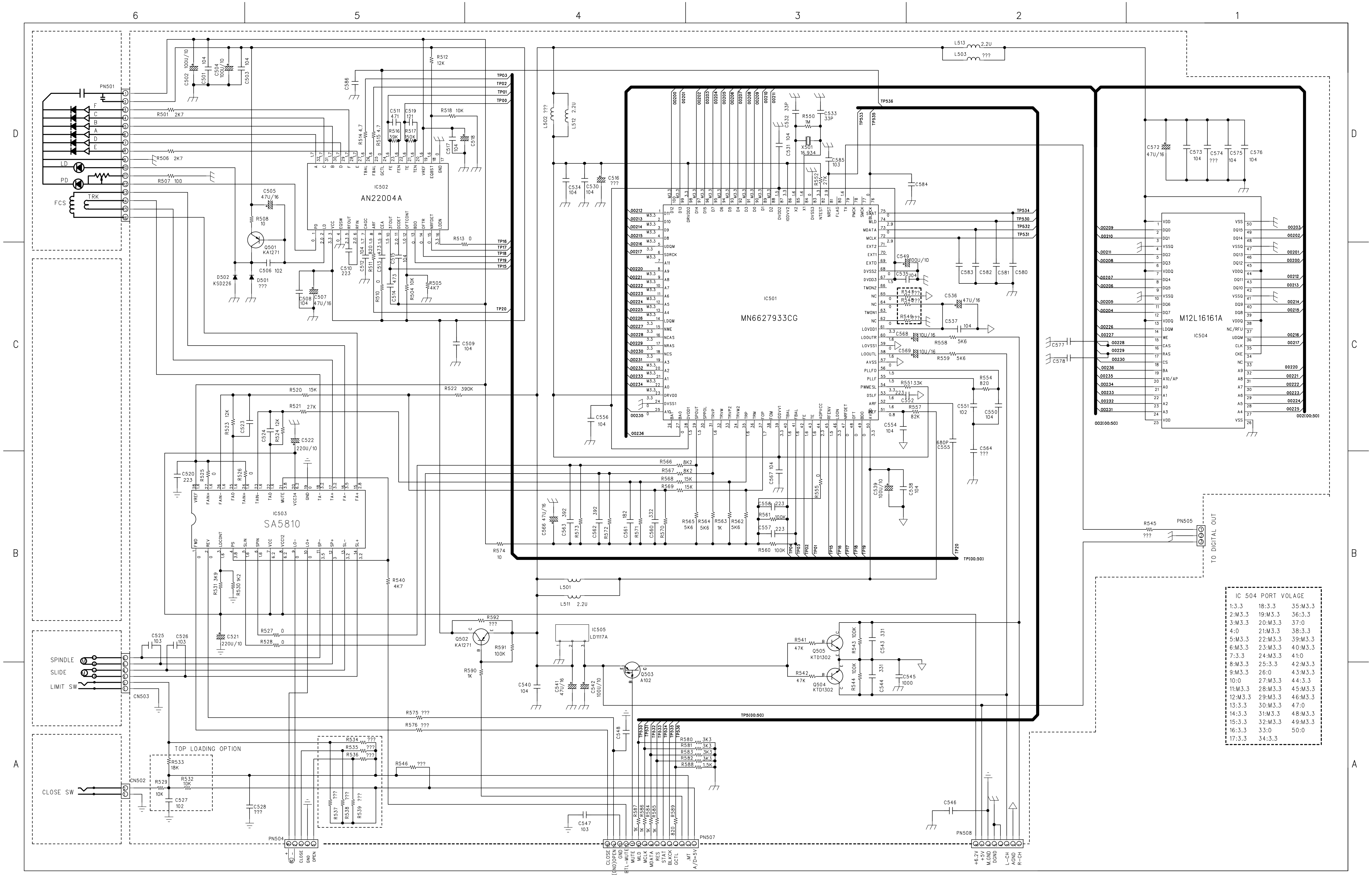


	NON PSAVE	PSAVE				
OW901	X	O				
OW902	X	O				
OW903	O	X				
OW904	O	X				

• TUNER SCHEMATIC DIAGRAM



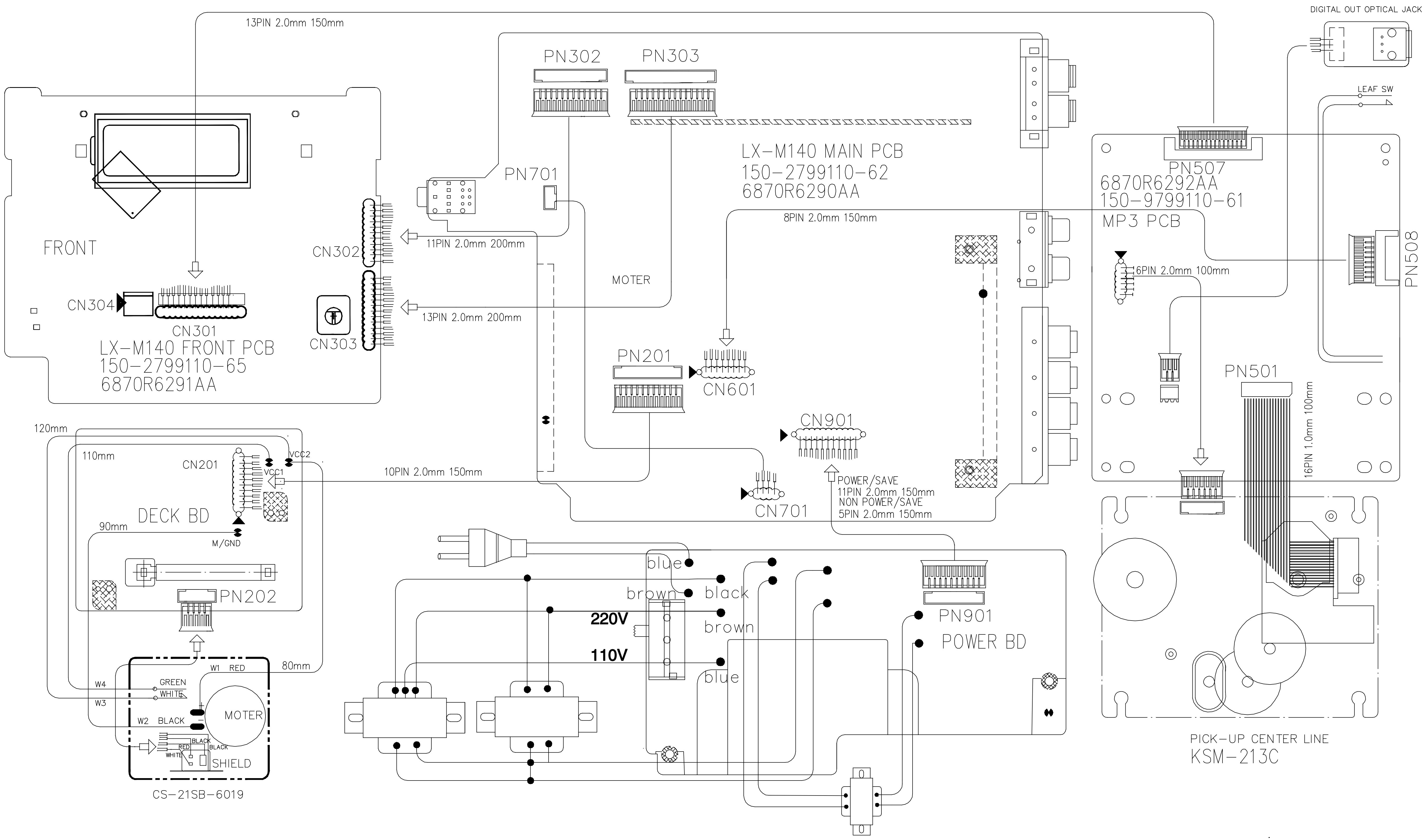
• CDP SCHEMATIC DIAGRAM



IC 504 PORT VOLAGE

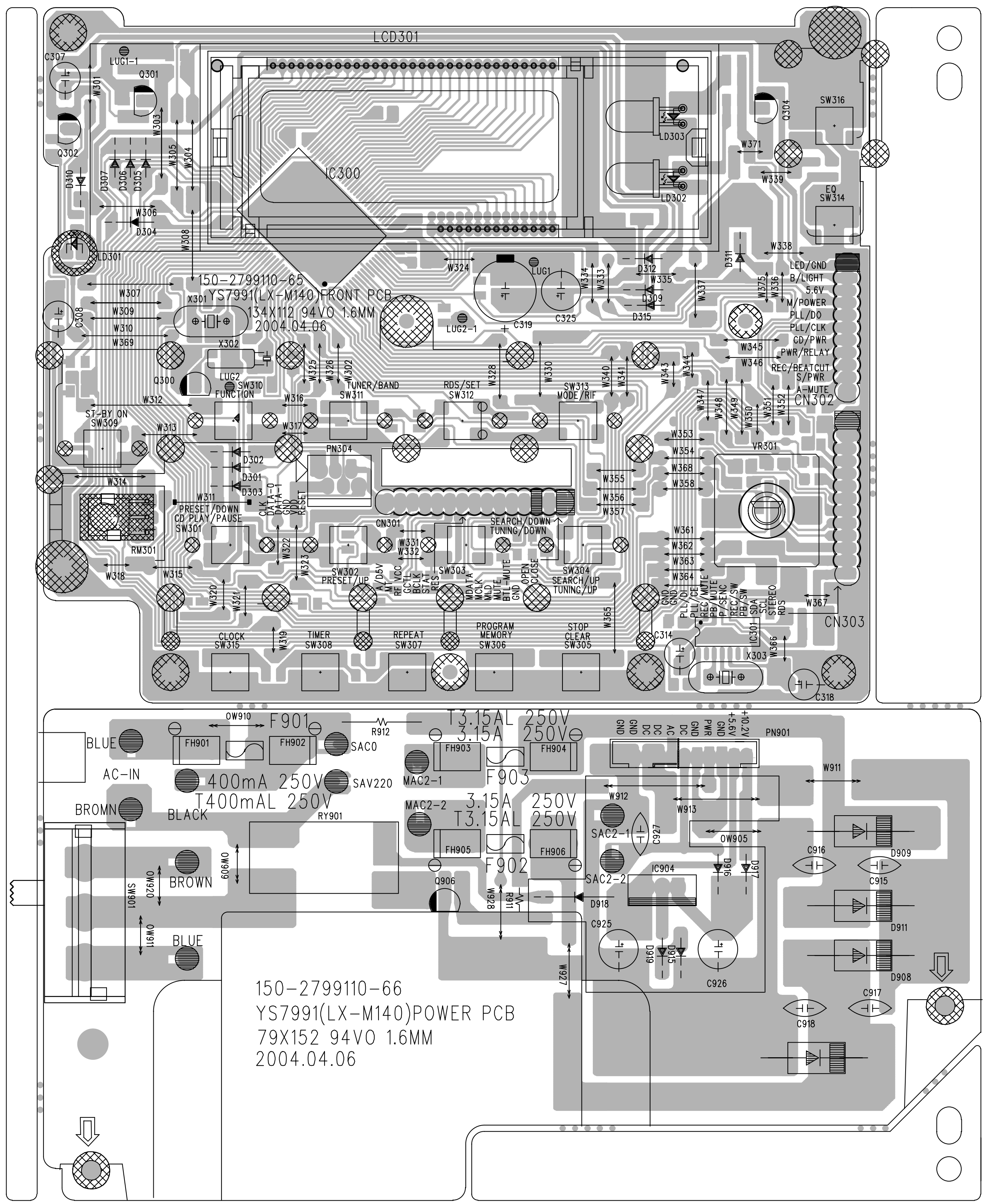
1:3.3	18:3.3	35:M3.3
2:M3.3	19:M3.3	36:3.3
3:M3.3	20:M3.3	37:0
4:0	21:M3.3	38:3.3
5:M3.3	22:M3.3	39:M3.3
6:M3.3	23:M3.3	40:M3.3
7:3.3	24:M3.3	41:0
8:M3.3	25:3.3	42:M3.3
9:M3.3	26:0	43:M3.3
10:0	27:M3.3	44:3.3
11:M3.3	28:M3.3	45:M3.3
12:M3.3	29:M3.3	46:M3.3
13:3.3	30:M3.3	47:0
14:3.3	31:M3.3	48:M3.3
15:3.3	32:M3.3	49:M3.3
16:3.3	33:0	50:0
17:3.3	34:3.3	

❑ WIRING DIAGRAM

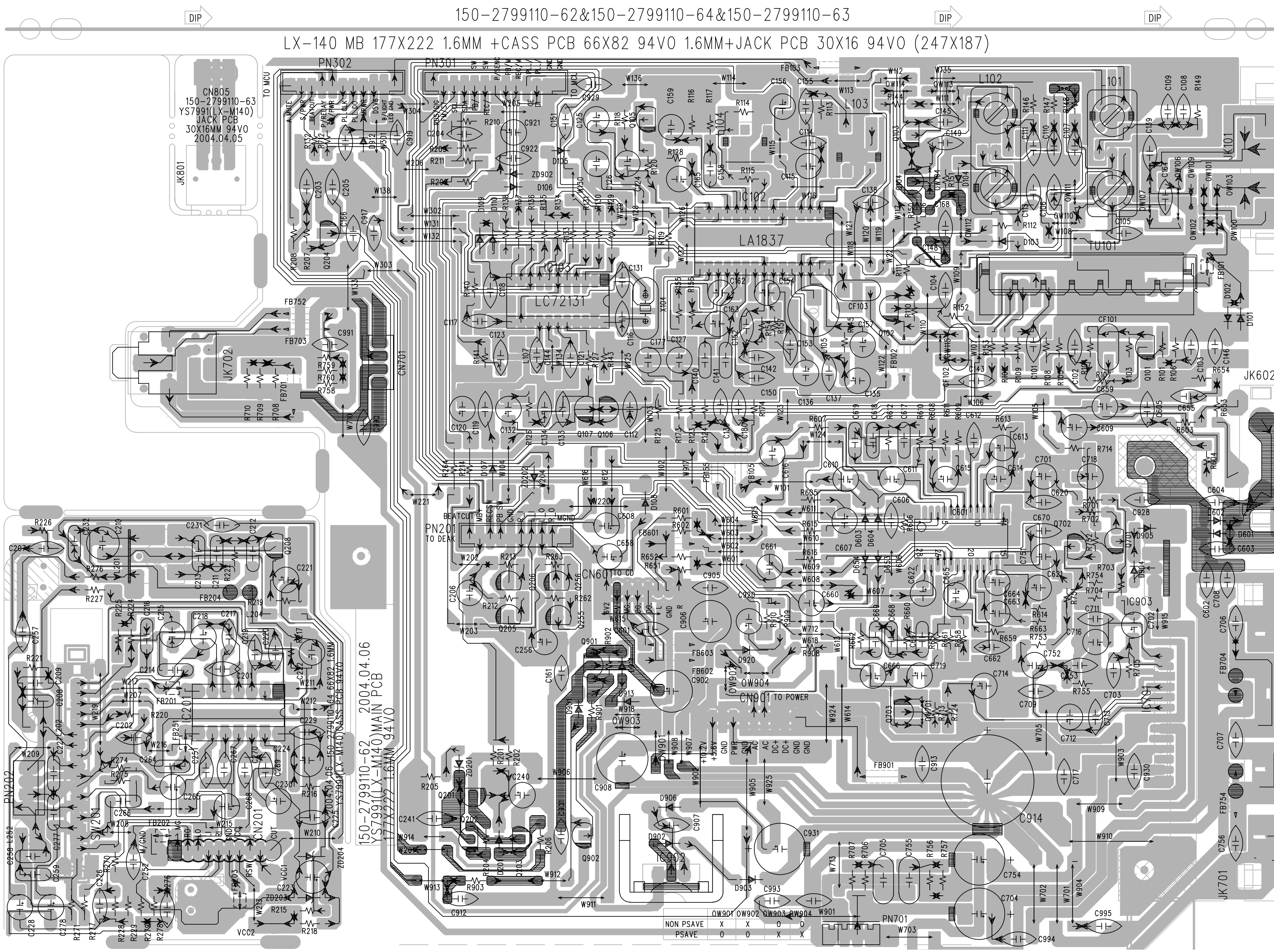


❑ PRINTED CIRCUIT DIAGRAMS

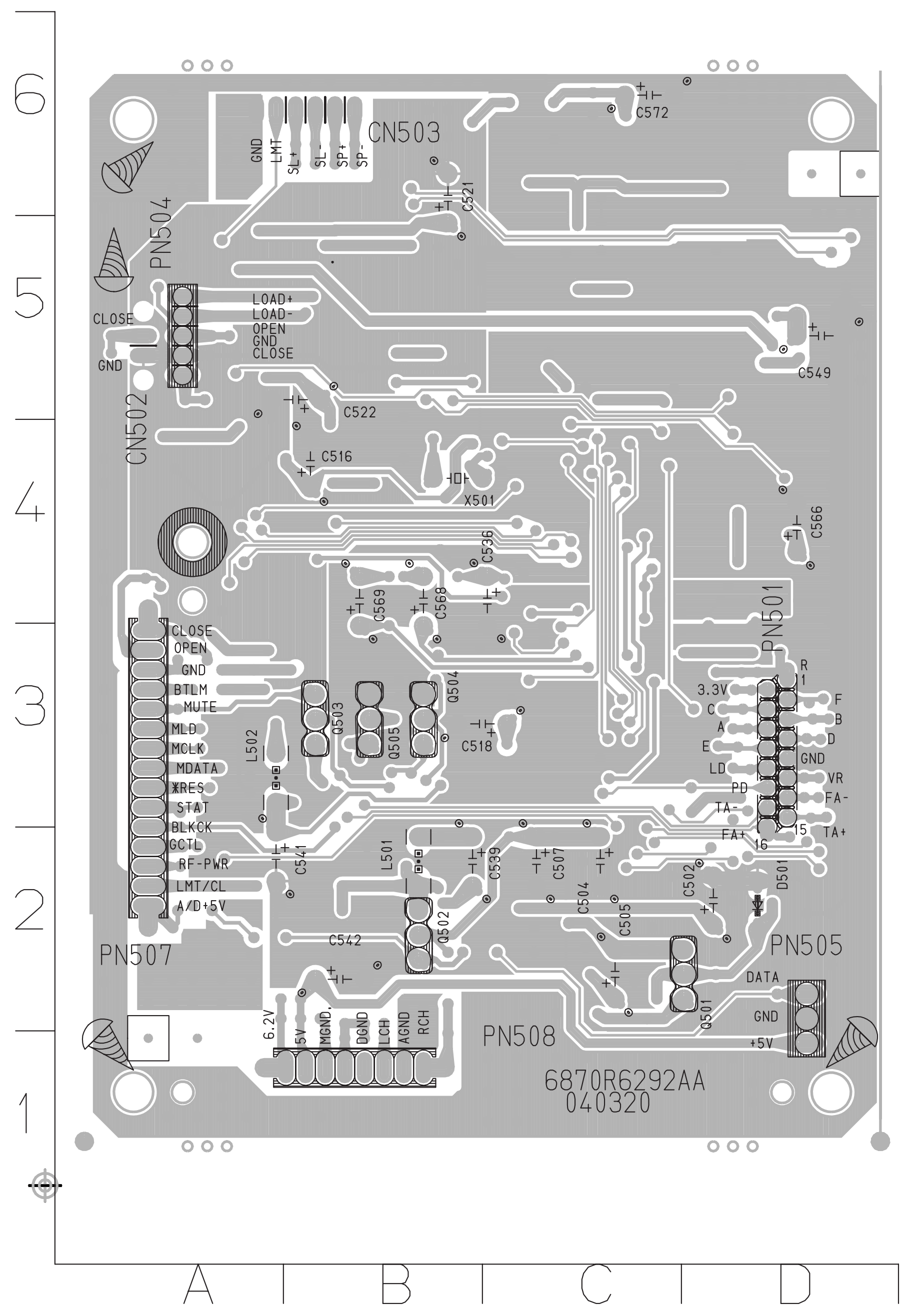
• FRONT P.C. BOARD



• MAIN P.C. BOARD



• CDP P.C. BOARD

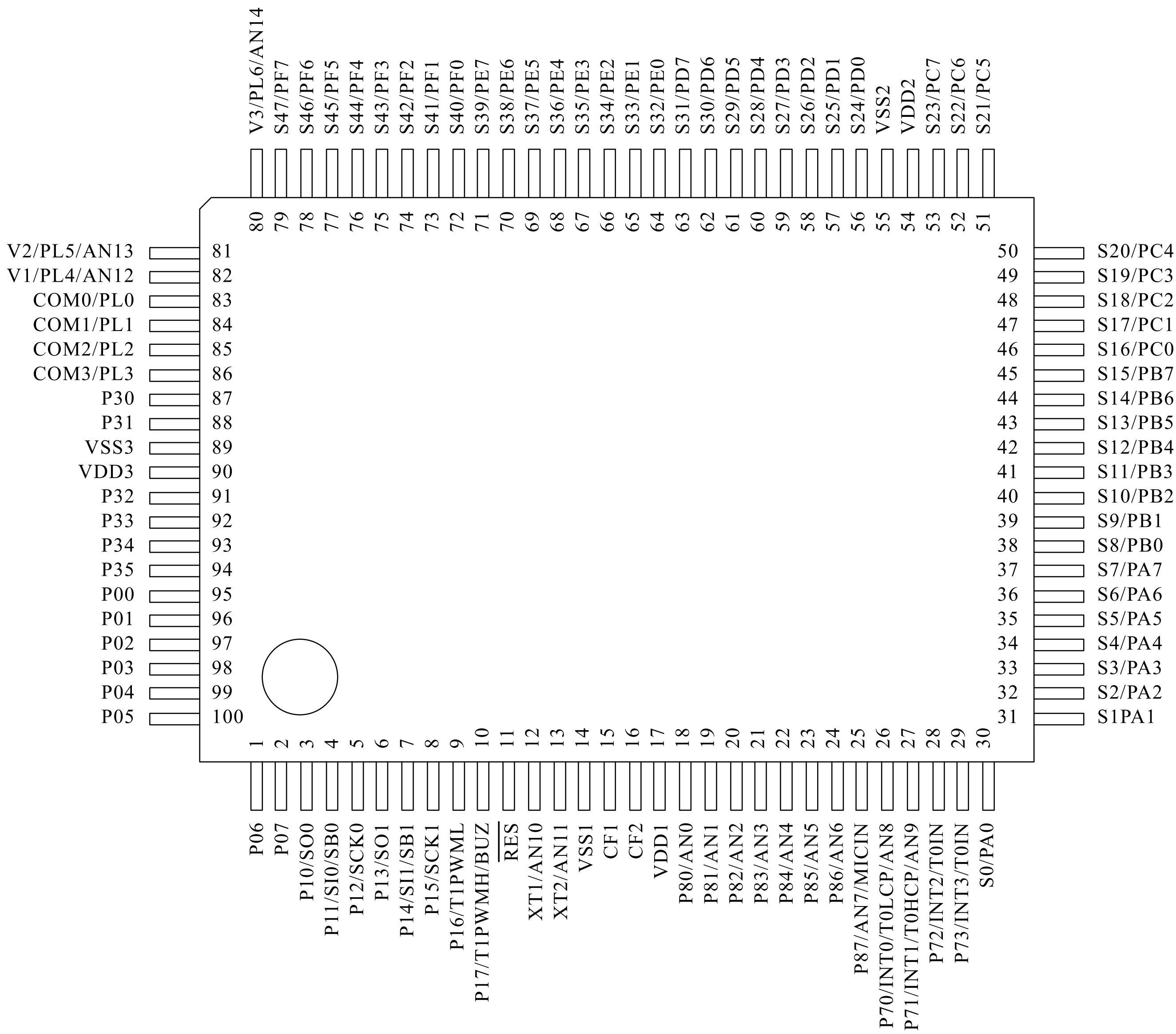


C501	C2	C543	B3	D502	D2	R525	B5	R568	D4	TP508	D2
C502	D2	C544	B3	IC501	C4	R526	B5	R569	D4	TP510	D2
C503	D3	C545	D4	IC502	C3	R527	A5	R571	D4	TP511	B6
C504	C2	C546	A2	IC503	B5	R528	A5	R572	D5	TP512	B3
C505	C2	C547	A4	IC504	C6	R529	A4	R573	D5	TP513	D5
C506	C2	C548	A3	IC505	B2	R530	A5	R574	D4	TP514	B6
C507	C2	C549	D5	L501	B2	R531	A5	R575	A3	TP515	B6
C508	C3	C550	C4	L502	A3	R532	A4	R576	A3	TP516	A6
C509	C3	C551	C4	L511	B2	R533	A4	R580	A3	TP517	A6
C510	C3	C552	C4	L512	B3	R534	A4	R581	A3	TP518	B6
C511	D3	C554	D4	L513	C6	R535	A4	R582	A3	TP520	A5
C512	C3	C555	C4	PN501	D2	R536	A5	R583	A3	TP521	A5
C513	C3	C556	D5	PN504	A5	R537	A4	R584	A3	TP522	A5
C514	C3	C557	D4	PN505	D2	R538	A4	R585	A3	TP523	A5
C515	C3	C558	D4	PN507	A2	R539	A5	R586	A3	TP530	A3
C516	B4	C560	D4	PN508	B1	R540	A3	R587	A3	TP531	A4
C517	D3	C561	D4	Q501	D2	R541	B3	R588	A2	TP532	A4
C518	C3	C562	D5	Q502	B2	R542	B3	R589	A2	TP533	A4
C519	D3	C563	D5	Q503	B3	R543	B3	R590	A2	TP534	A4
C520	B5	C564	C4	Q504	B3	R544	B3	R591	B2	TP535	C4
C521	B6	C566	D4	Q505	B3	R545	C4	R592	B2	TP536	C3
C522	B5	C567	C3	R501	D2	R546	A4	TP1	C6	TP540	B2
C523	B5	C568	B4	R504	C3	R547	C4	TP12	D5	TP541	A1
C524	B5	C569	B4	R505	C3	R548	C4	TP13	D6	TP550	D4
C525	B6	C572	C6	R506	D3	R549	C4	TP2	C6	TP551	D3
C526	B6	C573	C6	R507	D2	R550	B4	TP20	C5	TP552	C3
C527	A4	C574	C6	R508	C2	R551	C4	TP21	C5	TP553	D3
C528	A4	C575	D6	R510	C3	R552	B4	TP22	C5	TP554	D4
C530	B4	C576	C6	R511	C3	R554	C4	TP25	C5	TP555	C3
C531	C4	C577	C6	R512	D3	R555	D4	TP29	C5	TP556	C3
C532	B4	C578	C6	R513	C3	R557	D4	TP3	C6	TP557	D4
C533	B4	C580	C4	R514	D3	R558	B3	TP35	D5	TP558	C3
C534	C5	C581	C4	R515	D3	R559	B3	TP4	C6	TP559	C3
C535	C4	C582	C4	R516	D3	R560	D4	TP5	C5	TP560	B5
C536	C4	C583	C4	R517	D3	R561	D4	TP501	D4	TP561	B5
C537	C3	C584	C4	R518	D3	R562	D4	TP502	C3	TP562	A5
C538	D4	C585	B4	R520	B5	R563	D4	TP503	D2	TP563	A5
C539	B2	C586	A2	R521	B5	R564	D5	TP504	D3	TP6	C5
C540	B2	CN502	A5	R522	B5	R565	D5	TP505	C3	TP7	C5
C541	A2	CN503	B6	R523	B5	R566	D5	TP506	D2	TP8	C5
C542	B2	D501	D2	R524	B5	R567	D5	TP507	C2	X501	B4

❑ INTERNAL BLOCK DIAGRAM OF ICs

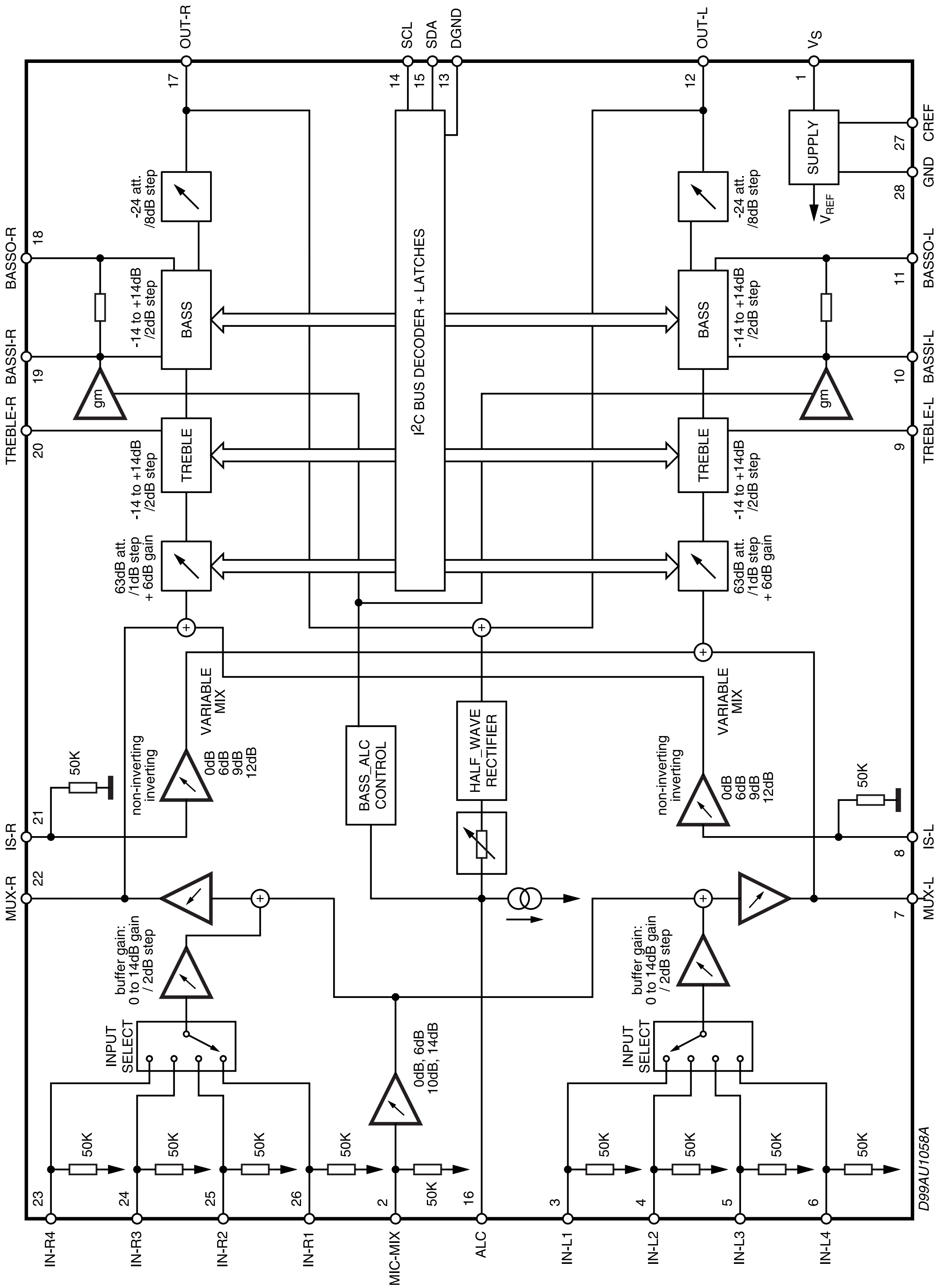
■ IC300 LC87F73C8A

1) Pin Assignment

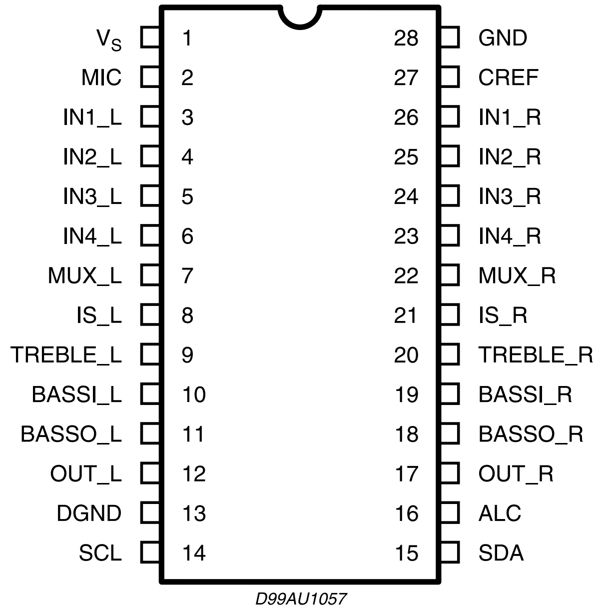


■ IC601 TDA7468D

1) BLOCK DIAGRAM

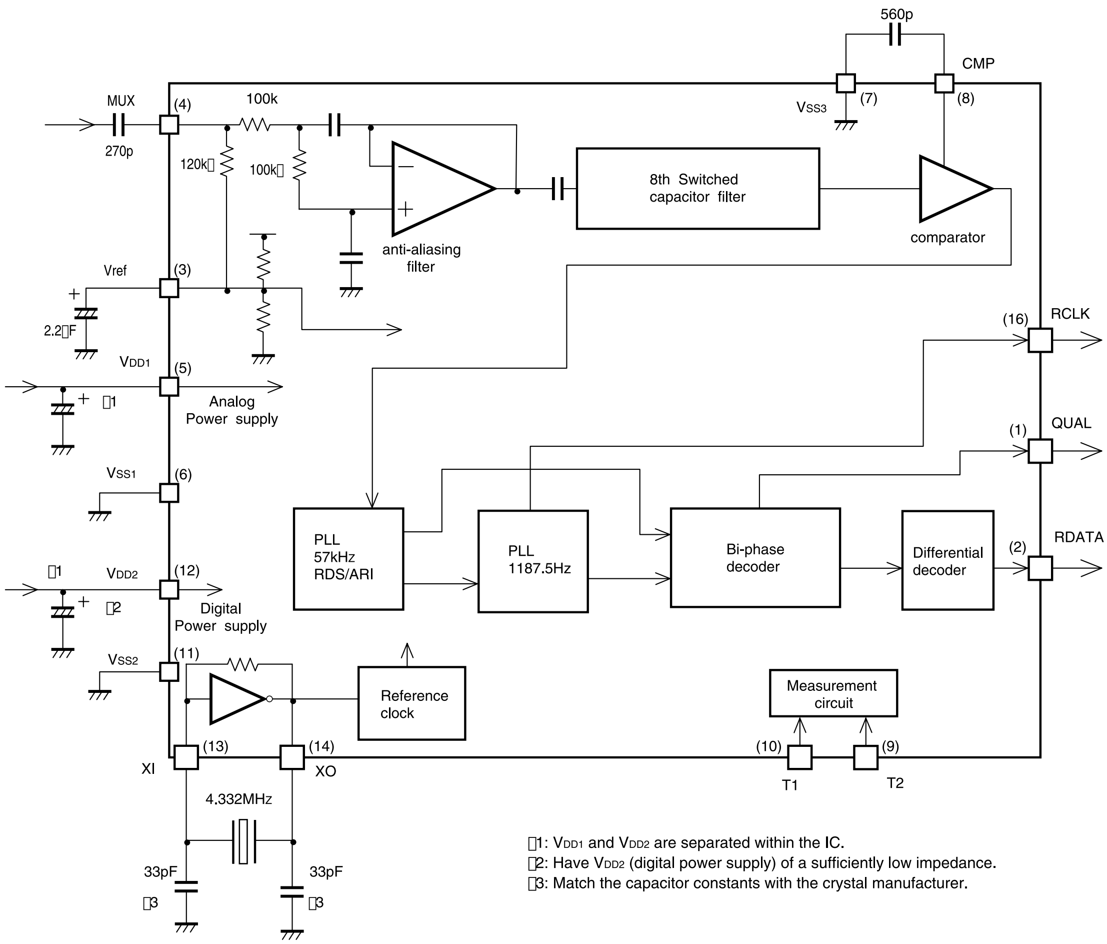


2) PIN CONNECTION

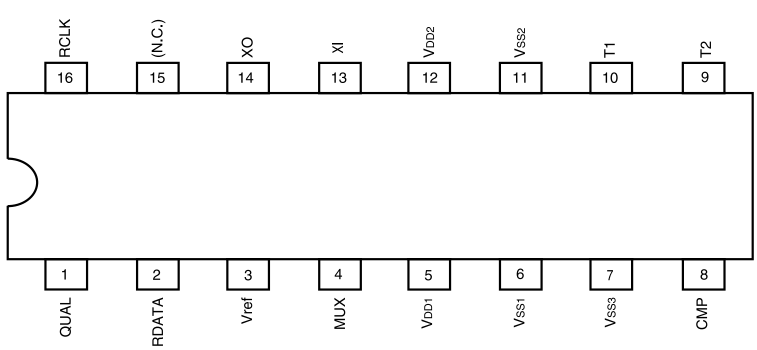


■ IC301 BU1923

1) BLOCK DIAGRAM

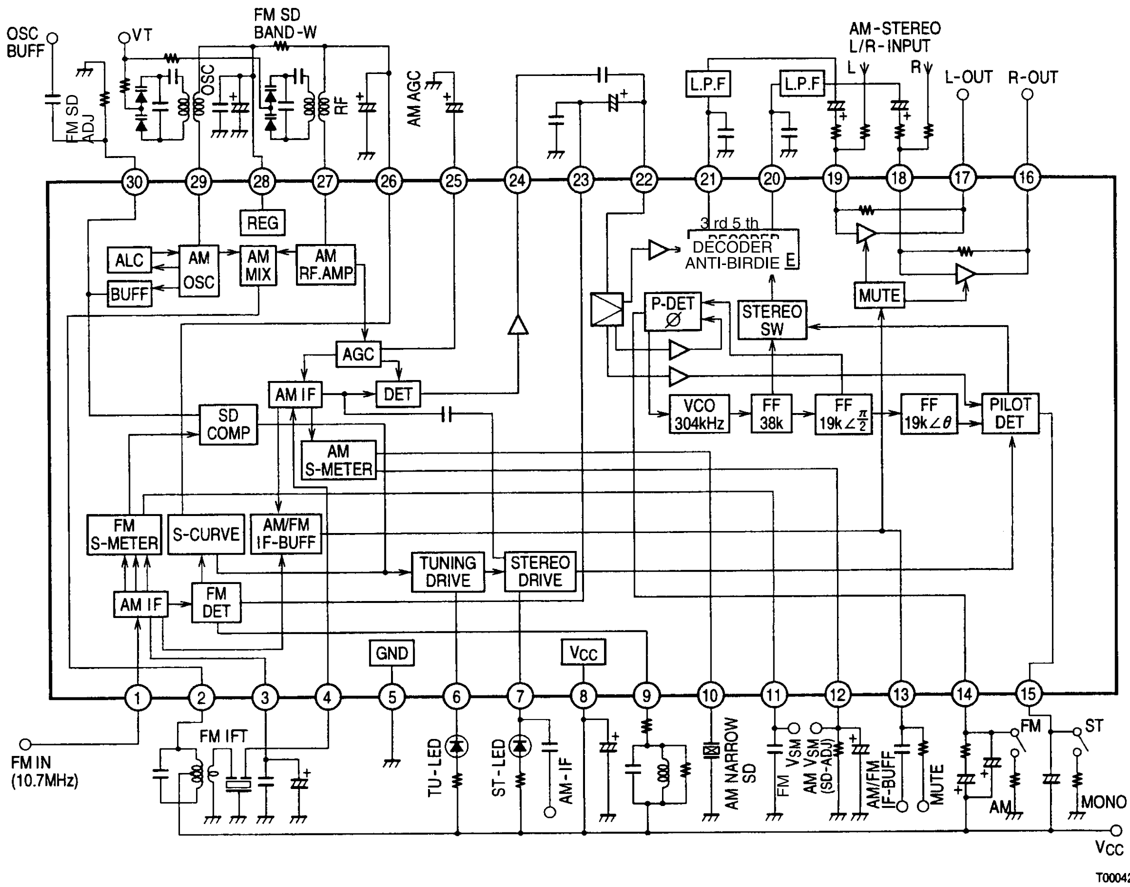


※1: VDD1 and VDD2 are separated within the IC.
※2: Have VDD2 (digital power supply) of a sufficiently low impedance.
※3: Match the capacitor constants with the crystal manufacturer.

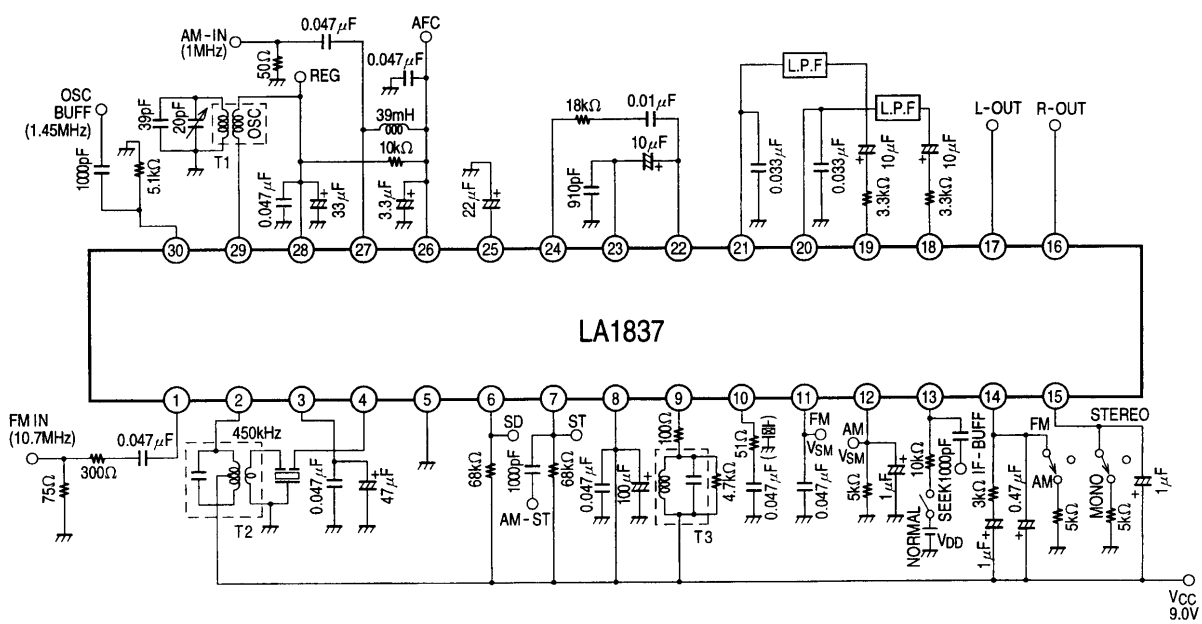


■ IC102LA1837

1) BLOCK DIAGRAM

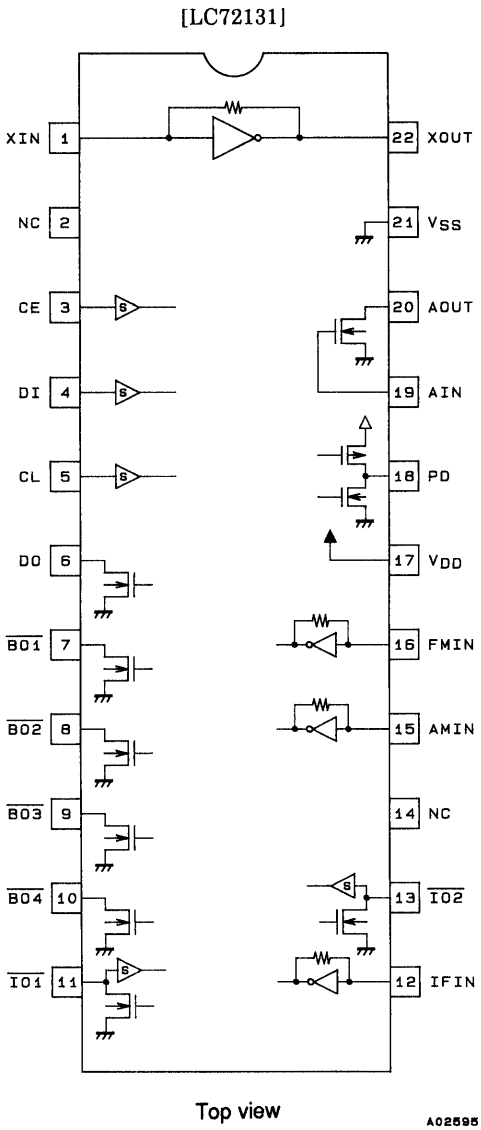


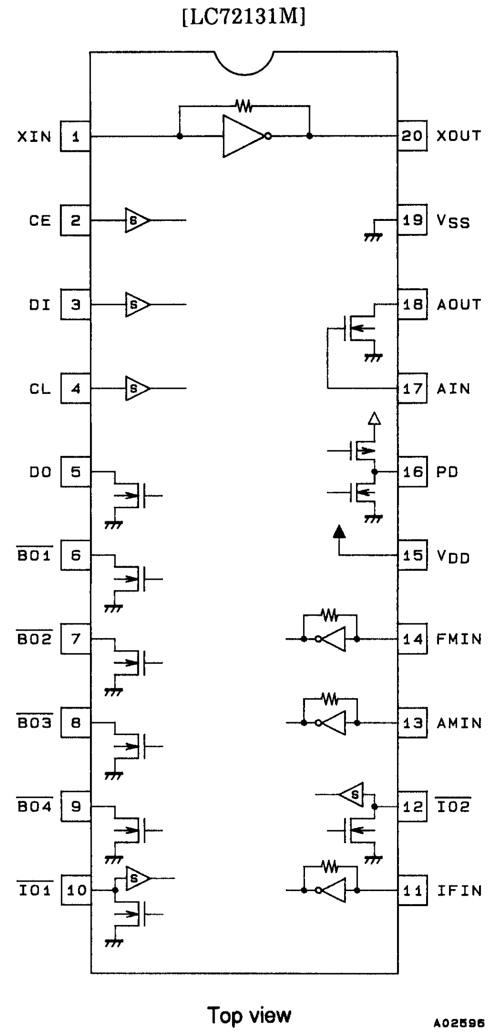
2) Test Circuit Diagram



■ IC103 LC72131D

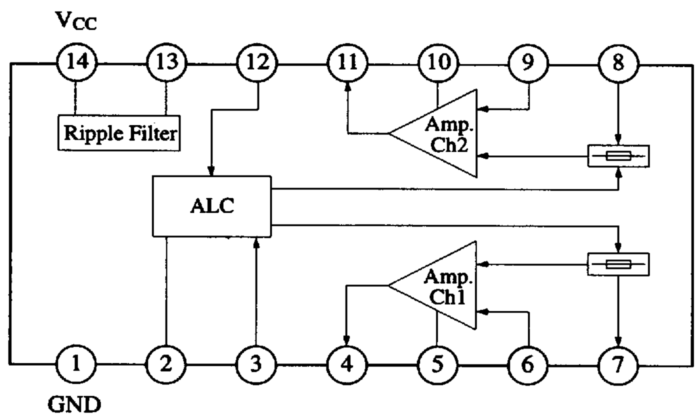
1) Pin Assignments





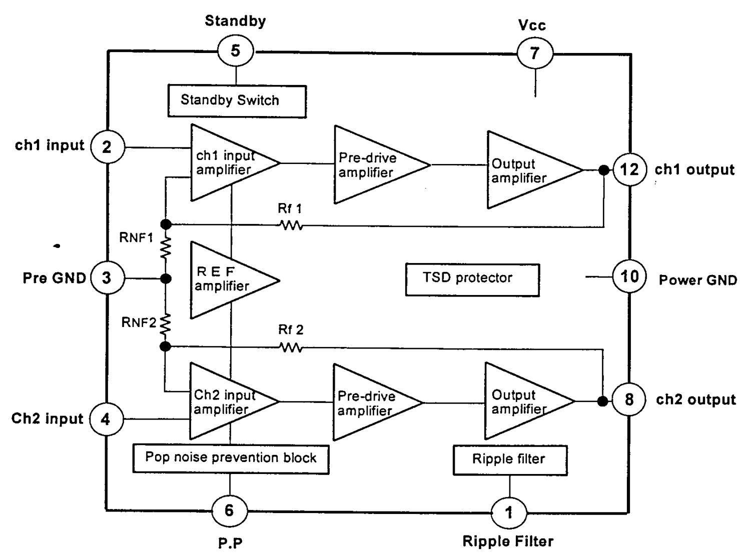
■ IC201 AN7312

1) BLOCK DIAGRAM



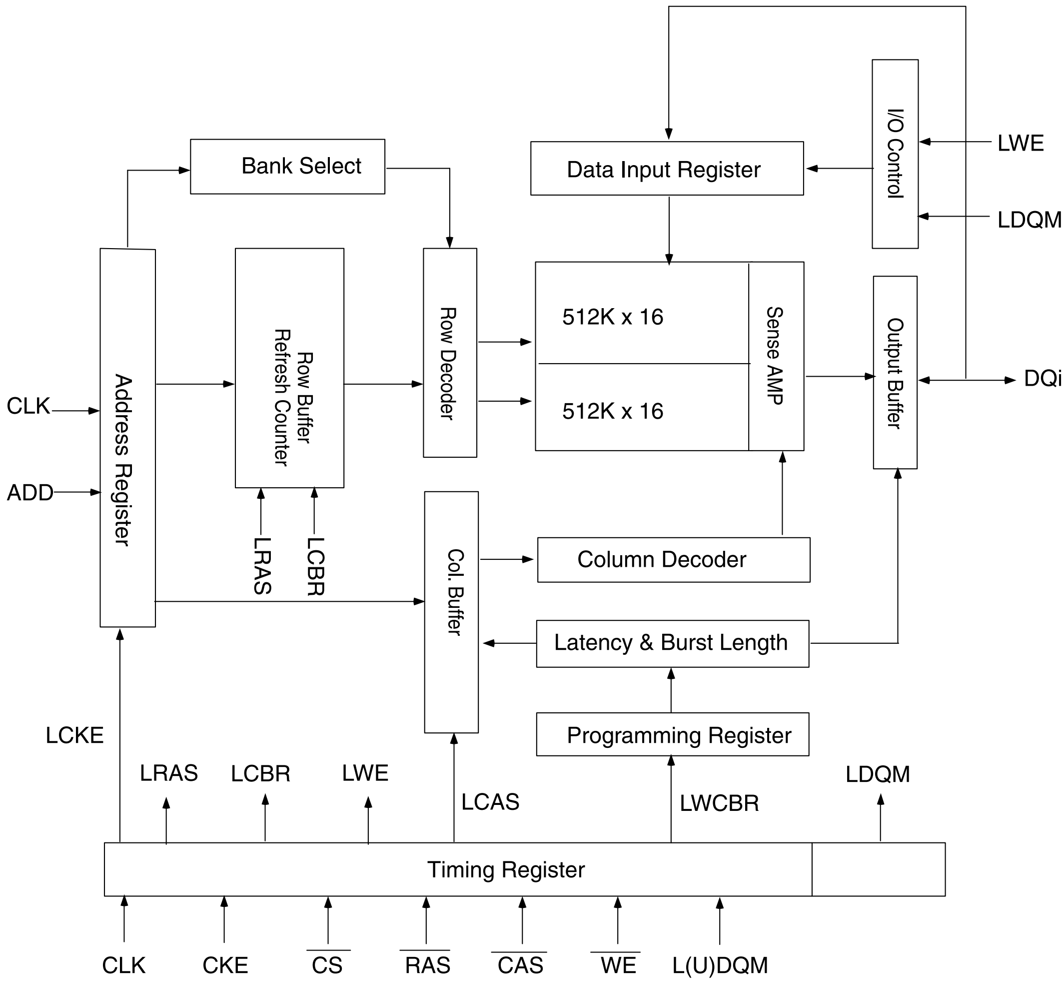
■ IC701 LA4631

1) BLOCK DIAGRAM



■ IC504 M12L16161A

1) Synchronous DRAM



• PIN Definitions

PIN	NAME	INPUT FUNCTION
CLK	System Clock	Active on the positive going edge to sample all inputs.
CS	Chip Select	Disables or enables device operation by masking or enabling all inputs except CLK, CKE and L(U)DQM.
CKE	Clock Enable	Masks system clock to freeze operation from the next clock cycle. CKE should be enabled at least one cycle prior to new command. Disable input buffers for power down in standby.
A0~A10/AP	Address	Row/column addresses are multiplexed on the same pins. Row address: RA0 ~ RA10, column address : CA0~CA7
BA	Bank Select Address	Selects bank to be activated during row address latch time. Selects bank for read/write durring column address latch time.
RAS	Row Address Strobe	Latches row addresses ont eh positive going edge of the CLK with RAS low.
CAS	Column Address Strobe	Latches column addresses on the positive going edge of the CLK with CAS low. Enables column access.
WE	Write Enable	Enalbes write operation and row precharge. Latches data in starting form CAS, WE active.
L(U)DQM	Data Input/Output Mask	Makes data output Hi-z, tSHZ after the clock and masks the out-put. Blocks data input when L(U) DQM active.

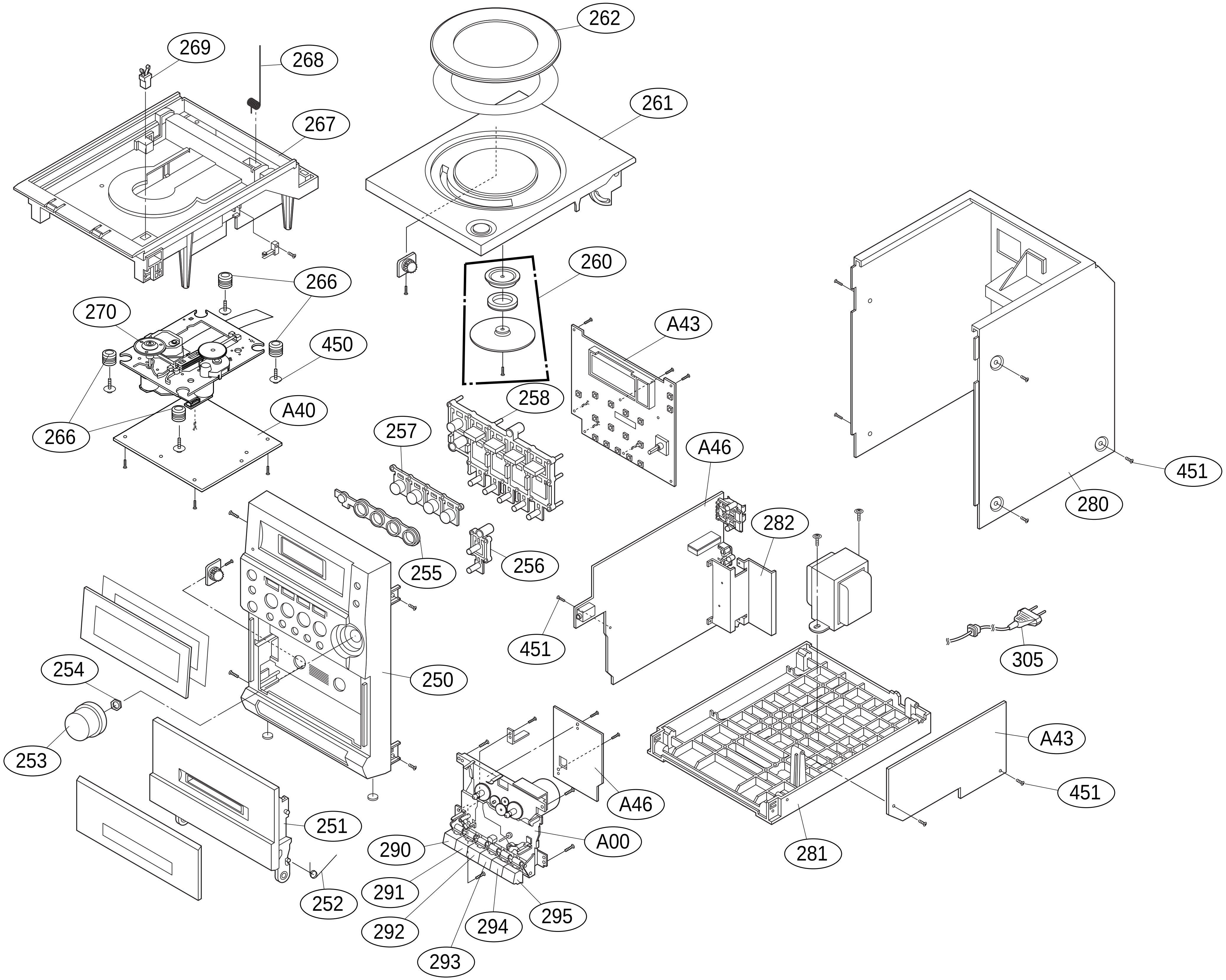
SECTION 3. EXPLODED VIEWS

• CABINET AND MAIN FRAME SECTION

NOTE) **Refer to “SECTION 5 REPLACEMENT PARTS LIST” in order to look for the part number of each part.**

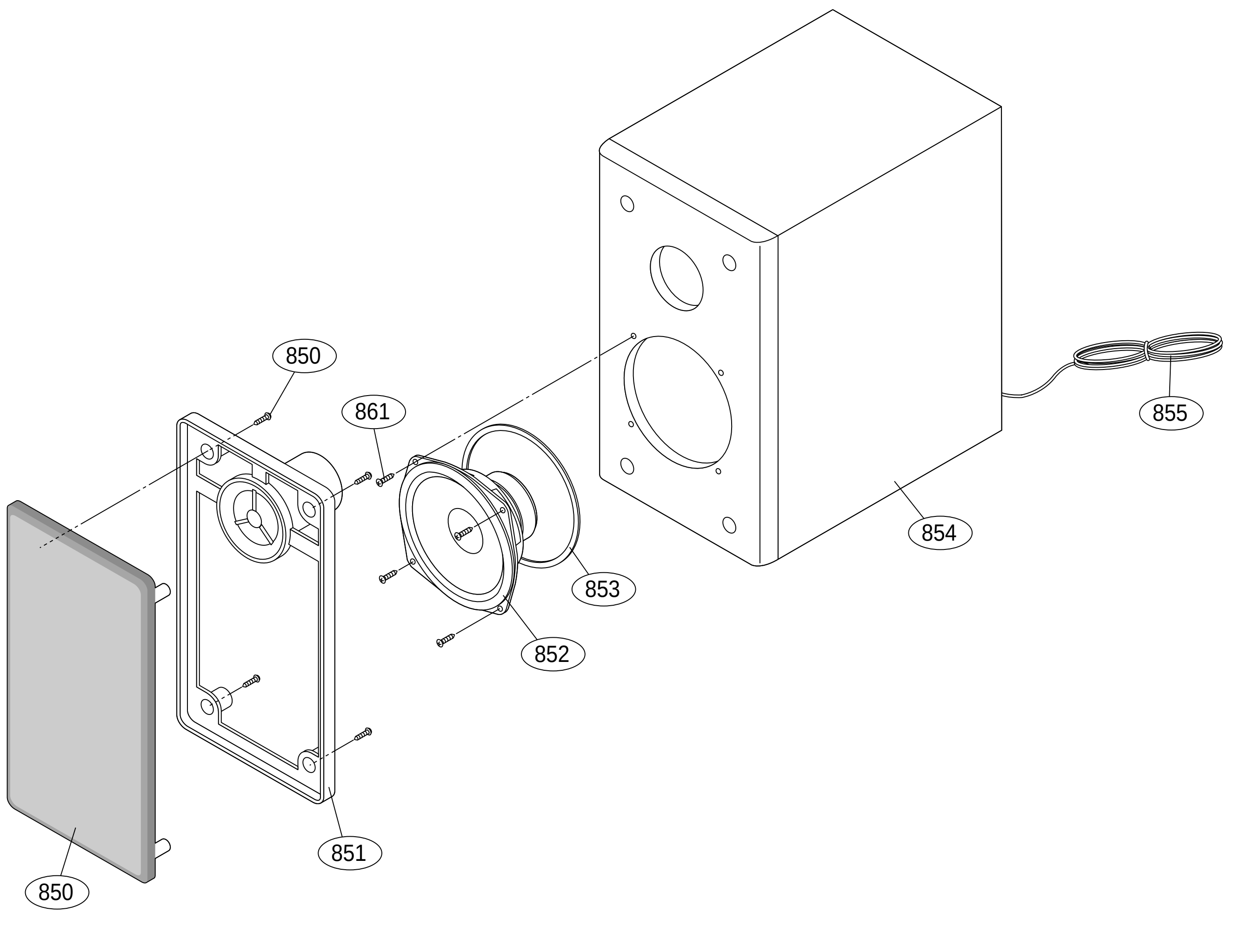
Caution point

A43: Front + Power Array Assembly.
A46: Main + TP Deck + Tuner Array Assembly.



SECTION 4. SPEAKER SECTION

❑ MODEL: LXS-M140



MEMO